

AVIATION WEEK

A MCGRAW-HILL PUBLICATION

OCT. 27, 1952

50 CENTS

Gas Turbine Thermocouples by **BG**



Engineered, developed and produced to meet the exacting requirements of gas turbine engines, BG thermocouples provide maximum performance and durability.

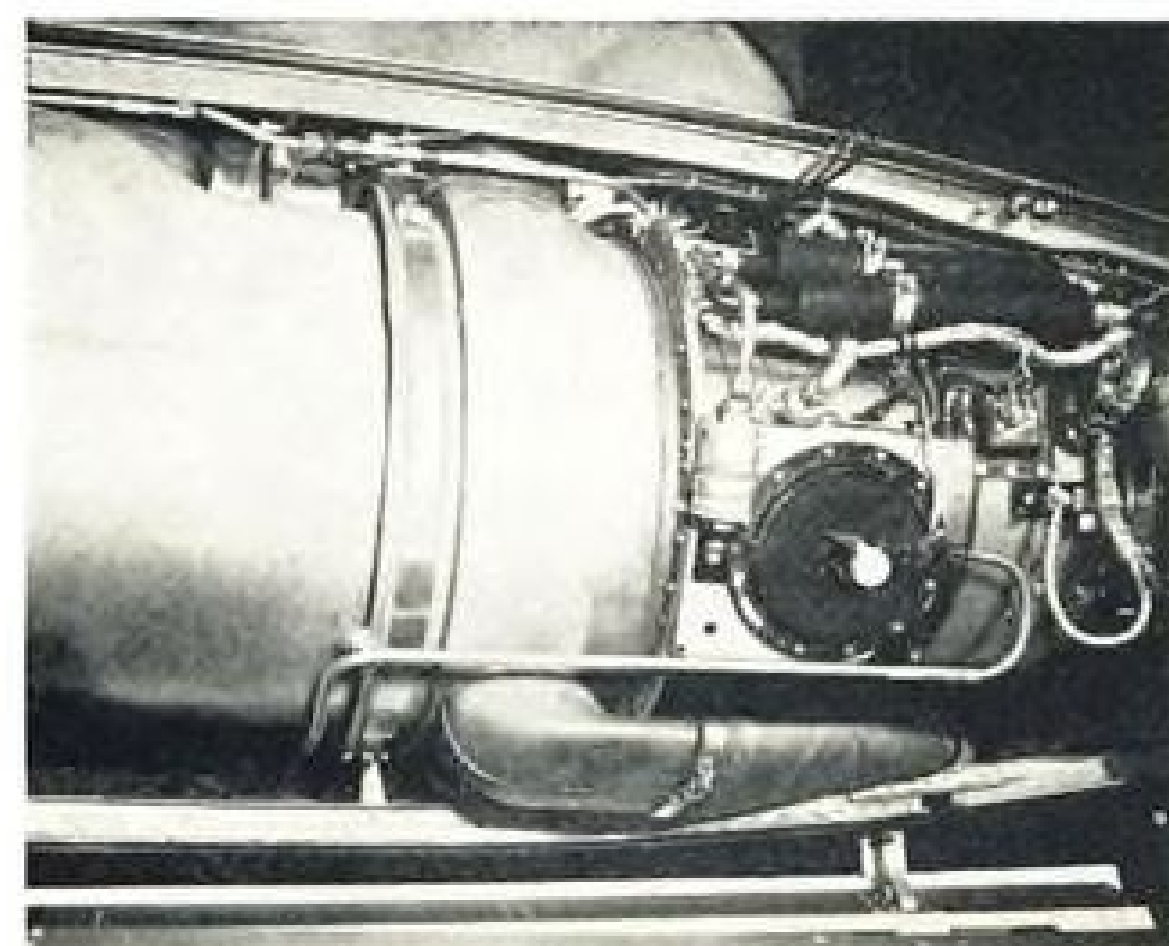
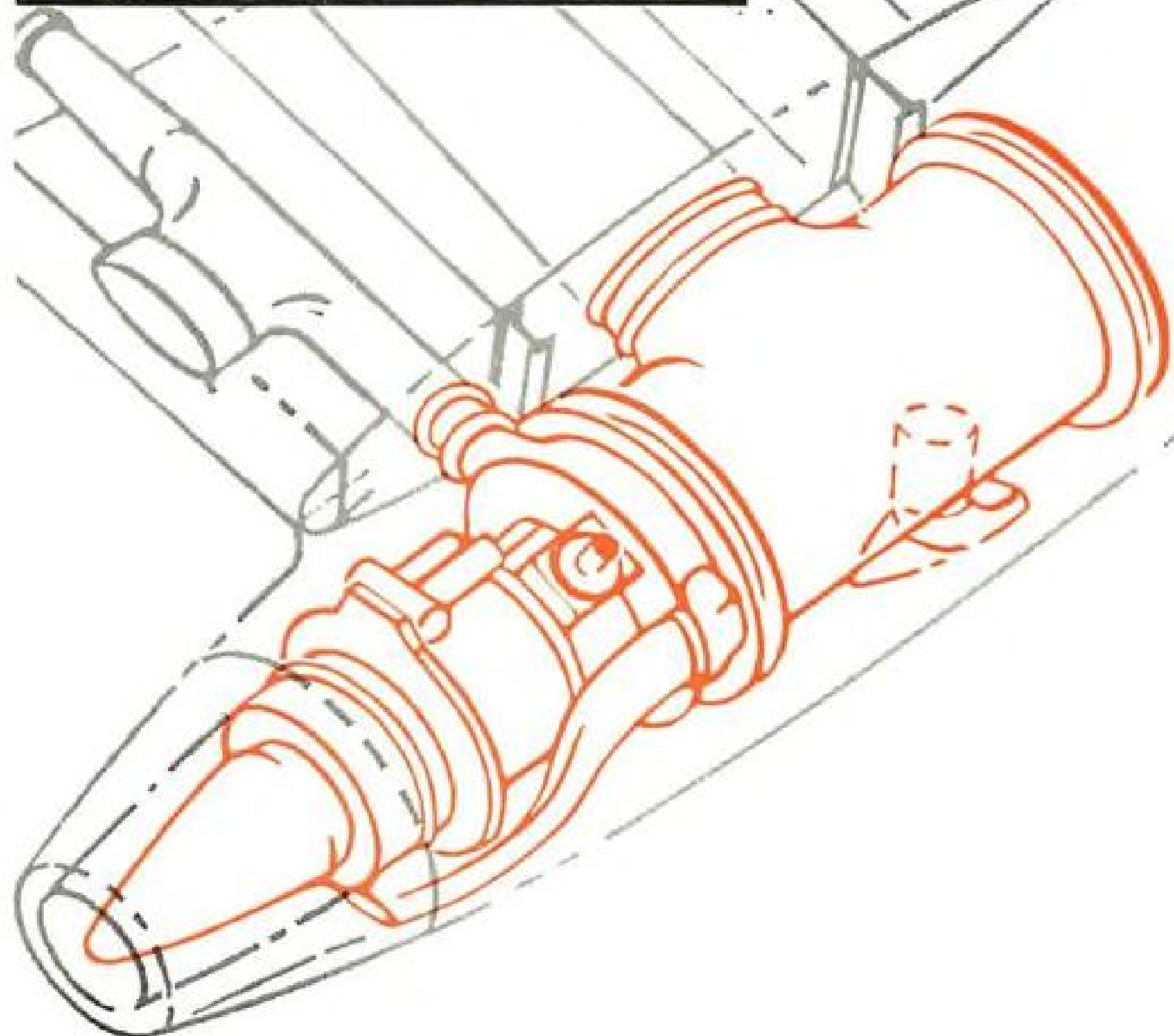
The exceptional performance of these thermocouples in military aircraft is further evidence that in aviation there is NO substitute for BG quality.

For information on these
and other BG products write to

THE BG CORPORATION
126 WEST 52nd STREET,
NEW YORK 19, N. Y.



hot tip! 600,000 b.t.u.s



Here's just about the newest and hottest thing in aircraft heating: 600,000 Btu/hour Janitrol combustion heaters in wing tip pods on the Douglas C-124A. Four of these units, and a 200,000 Btu/hour unit total 2.6 million Btu/hour—handle all anti-icing requirements as well as flight deck and cabin heat—increase capacity by 900,000 Btu/hour over that of the 12-unit Janitrol installation employed on the early version of this giant . . . Operational performance is improved: heaters are located at the tip of the wing where highest temperatures are required and the plane's service ceiling is upped 1,300 feet by the favorable end plate effect of the pods. This is another good example of Janitrol's long combustion engineering experience successfully teamed up with aircraft builders to "raise the ceiling" and "extend the range" of aircraft heater performance . . . The earlier in the design stage you call in your Janitrol representative on your heating problems—the better.



AIRCRAFT-AUTOMOTIVE DIVISION • SURFACE COMBUSTION CORPORATION • TOLEDO 1, OHIO

HEATERS WITH THE WHIRLING FLAME

Janitrol

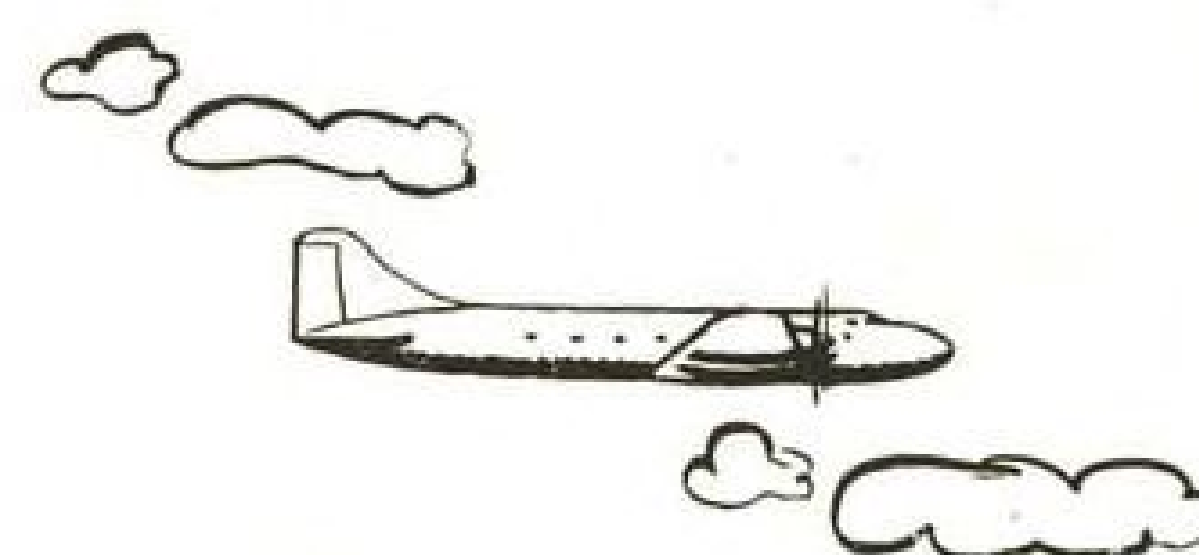
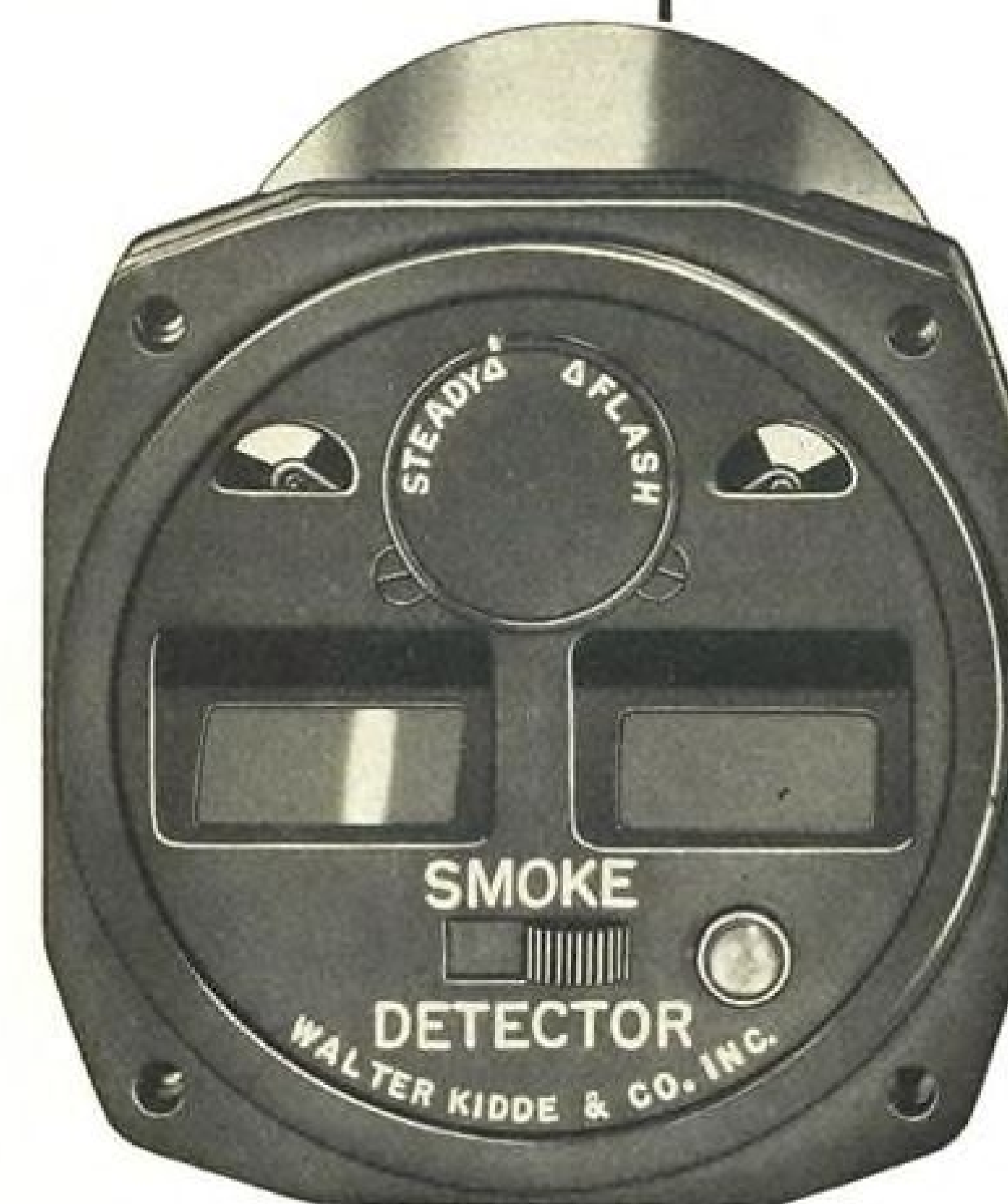
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This foolproof detector eliminates false alarms frequently caused by voltage fluctuations and from foreign matter. Write us for full particulars.



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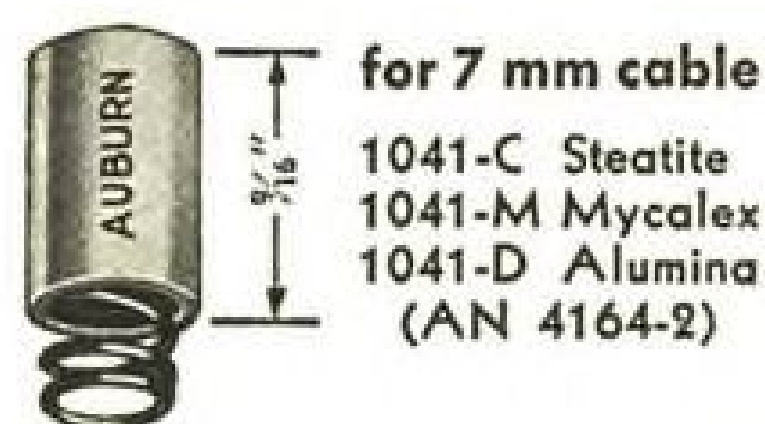
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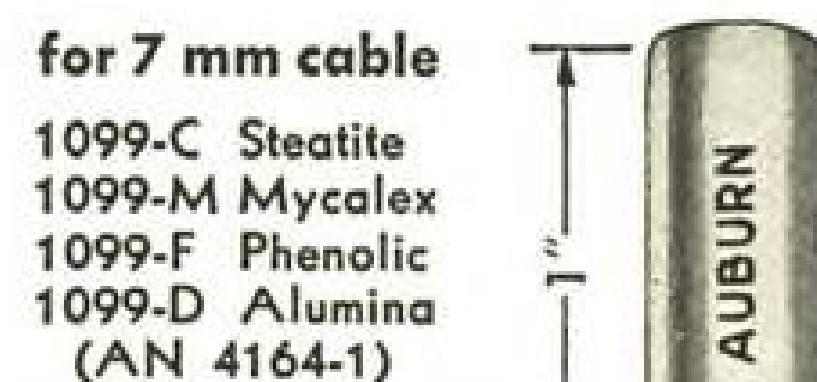


Auburn SPARK PLUG CONNECTORS

for aircraft

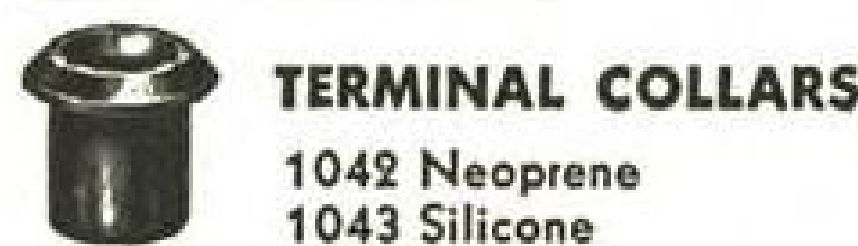


for 7 mm cable
1041-C Steatite
1041-M Mycalex
1041-D Alumina
(AN 4164-2)



for 7 mm cable
1099-C Steatite
1099-M Mycalex
1099-F Phenolic
1099-D Alumina
(AN 4164-1)

9/16" and 1" sleeves
only, without springs,
are also available

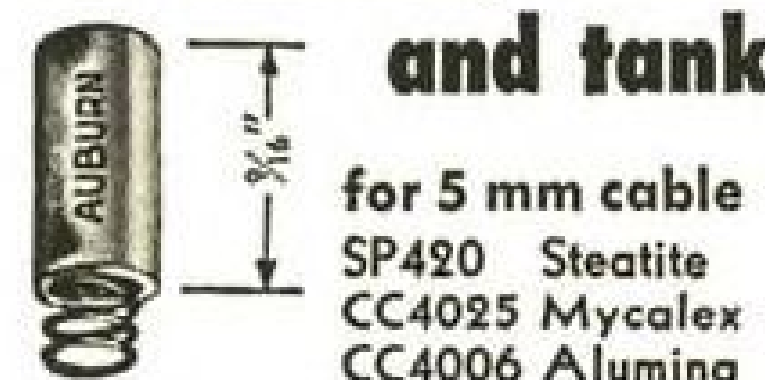


TERMINAL COLLARS

1042 Neoprene
1043 Silicone

Used with all 7/8" connectors on
7 mm cable

for military trucks and tanks

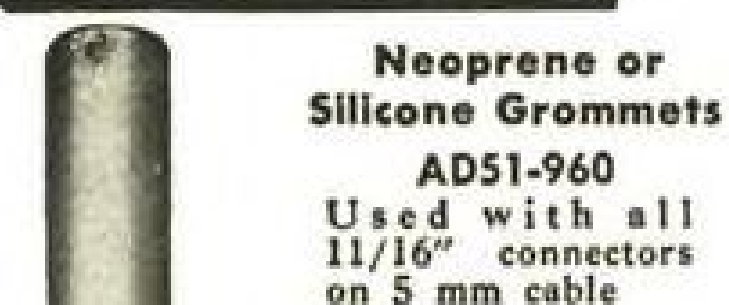


for 5 mm cable
SP420 Steatite
CC4025 Mycalex
CC4006 Alumina



for 5 mm cable
CC4017 Steatite
CC4020 Mycalex
CC4013 Alumina

9/16" and 11/16" sleeves
only, without springs,
are also available



Neoprene or Silicone Grommets

AD51-960
Used with all
11/16" connectors
on 5 mm cable



AD50-894
Used with all
9/16" connectors
on 5 mm cable

AA50-313 Spring Assembly

Used with all 9/16" and 11/16"
connectors for 5 mm cable

**AUBURN SPARK PLUG
Co. Inc., Auburn, N. Y.**

Aviation Week



Member



Volume 57

October 27, 1952

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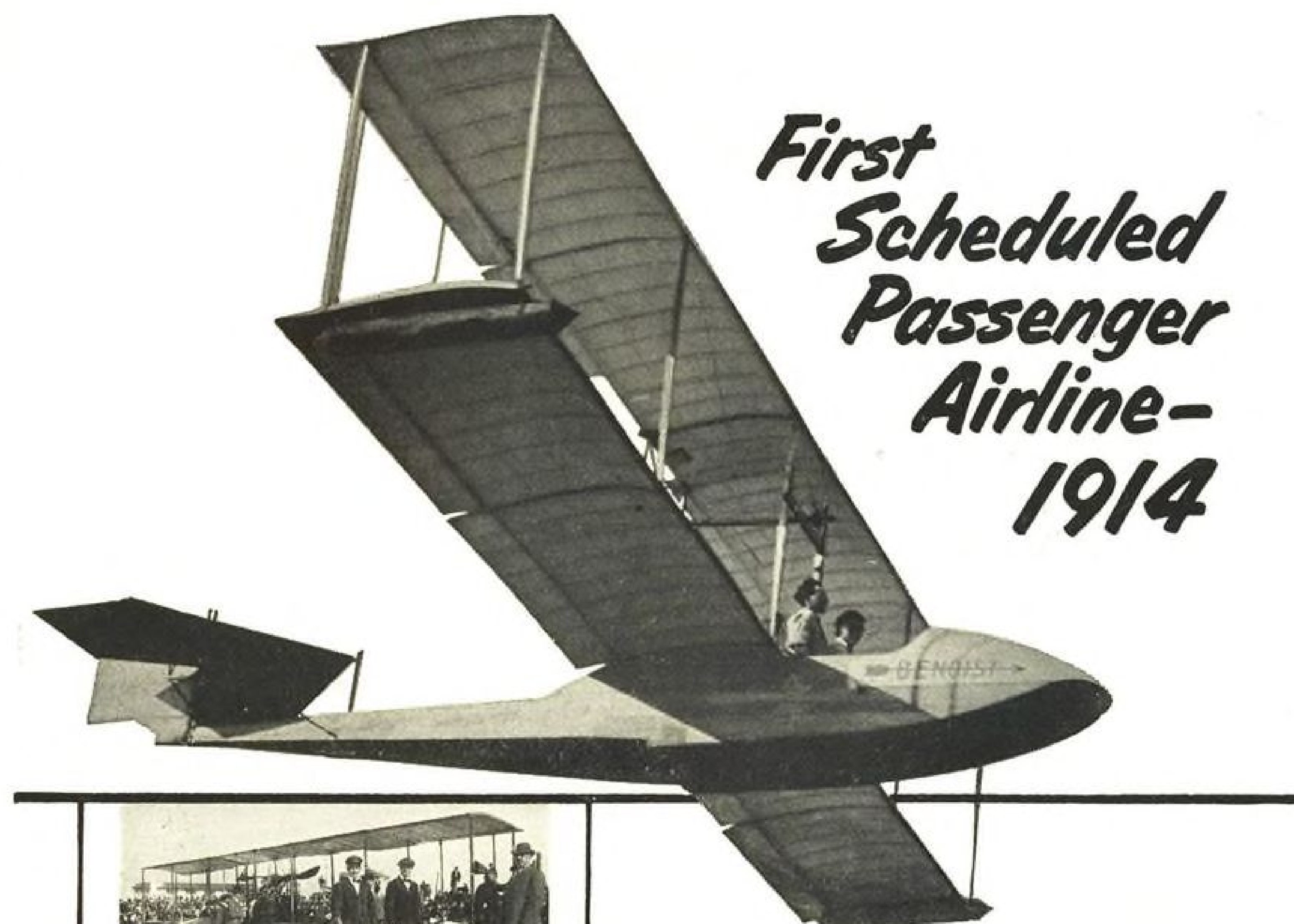
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*First
Scheduled
Passenger
Airline—
1914*



YESTERDAY

... the plane
used for regularly scheduled airline service
was the Benoist Flying Boat, flown by Tony
Janus (center, left) in 1914 from St. Peters-
burg, Florida to Tampa—twenty-two miles
away. On New Year's Day of that year, six
thousand excited spectators gathered to wit-
ness the inauguration of the St. Petersburg-
Tampa Airboat Line in daily scheduled flights.

TODAY

... plush ambassador service daily be-
tween New York and Los Angeles was recently introduced by
TWA-Trans World Airlines, with the first three of their order
of ten 64-passenger Super Constellation sky giants.



■ The great strides commercial avia-
tion has made since the days of the
country's first scheduled passenger air-
line is typical of the progress made in
every phase of aeronautical develop-
ment. The improvements in aviation fuels
and lubricants run parallel.

A pioneer in the field of special avia-
tion gasolines and lubricants, Phillips
Petroleum Company for years has been
one of the country's largest suppliers of
aviation fuels for commercial and mili-
tary as well as private use.

For the finest in aviation products,
rely on Phillips... first choice where
performance counts!

AVIATION DIVISION
PHILLIPS PETROLEUM COMPANY
BARTLESVILLE, OKLAHOMA



AVIATION PRODUCTS



How Pioneer's typing pool cut secretarial overhead by 20%

• Remington Electri-economy typewriters enable expanding airline to handle twice the volume of paperwork...with 20% fewer typists!

► Five years ago Pioneer Air Lines had seven DC-3 airplanes, and carried 67,000 passengers. Today, they operate nine giant Martin Pacemasters, and expect to carry 300,000 people annually. ► During this 5-year expansion, Pioneer's volume of paperwork doubled! Yet their office staff consistently stayed ahead of schedule. And did it with 20% fewer people.

► What's The Secret? Gen. Smith says: "Pool set-up enables us to get max-

imum production from each typist. But the big 'reason-why' is the Remington Electri-economy typewriter! Its amazing speed and electric ease-of-operation gives us the equivalent of 10 hours work from our 8-hour typists. We use a lot of carbon copies. The Electri-economy turns out 15 and more fully-readable carbons—all with a single typing. What's more, typing accuracy

has improved. And our letters are far more uniform and distinctive."

► These same advantages of Electri-economy typing are available to any company—large or small. Anyone desiring free demonstration of Electri-economy typing, or free booklet "Take a Letter" (RE 8499) should write Remington Rand Inc., Room 2428, 315 Fourth Ave., New York 10, N. Y.



"SPEED COUNTS AT PIONEER,"

says Margaret Brown, executive secretary to Gen. Smith. "That's why I consider my Electri-economy 'tops.' Its amazing speed and automatic features enable me to turn out better-looking letters faster, and more accurately. It's the perfect typewriter."

NEWS DIGEST

Domestic

Douglas X-3 high-speed research plane made its first flight last week at Edwards AFB in California with Bill Bridgeman, Douglas test pilot, at the controls. The supersonic X-3 is powered by two Westinghouse J40 axial turbojets.

Amos Culbert, vice president-sales, Northwest Airlines, has resigned. His future plans are not disclosed. Malcolm S. MacKay, NWA executive vice president will handle Culbert's duties temporarily. James Mariner, general sales manager, has been promoted to assistant vice president-sales. He joined the carrier in 1947.

U. S. civil plane exports during September totaled 25 units weighing 6,000 lb. and less, valued at \$145,563; total brings to 255 the aircraft exported in the first nine months of this year, valued at \$1,896,171.

Personal and executive plane shipments during September totaled 301 one-to-ten place units valued at \$2,472,000. In the first nine months of 1952, Cessna lead with shipment of 1,101 planes, Piper was second with 910 and Beech third with 320.

Stephen Leo vice president of Sverdrup & Parcel, Inc., has completed his temporary assignment as managing director of Aro, Inc., Tullahoma Tenn., and returned to S&P in St. Louis. T. F. Farrell replaced Leo at Aro, Inc.

Second prime letter contract for McDonnell F3H Demon fighter has been granted Temco Aircraft Corp., Dallas. Award called for a "substantial additional quantity" of the Navy carrier fighters.

Charles Kendall was named general counsel of the Office of Defense Mobilization in Washington. He formerly served in the same capacity for the Defense Production Administration and National Security Resources Board.

Airlifts, Inc., Miami, Fla., is undergoing preliminary financing to produce Burnelli-designed cargo planes based on the Loadmaster airfoil-fuselage design. The prototype will have more powerful engines installed.

Edwin A. Speakman has been appointed general manager of Fairchild Guided Missiles division of Fairchild Engine and Airplane Corp. He has



FLETCHER FD-25 DEFENDER, baby tactical support single-seater, has climbed into the spotlight with announcement by company officials that an agreement has been signed with the Toyo Aircraft Co., to build the plane in Japan. It's expected to be

been vice-chairman of the Defense Department Research and Development Board for past two years.

National Airlines alleges that Eastern Air Lines directors and associates bought indirect control of Colonial to merge it with Eastern instead of National. Cited are "recent" stock acquisitions by six parties who hold a total of 14% of outstanding shares, compared with Sigmund Janas' previously effective control with 8%.

Financial

American Airlines, Inc. showed a net income after taxes of \$9,762,000 on gross revenues of \$138,460,000 (gross \$120,381,000) for the same period in 1951. AA declared a dividend of 25 cents on \$1 par value common stock and the regular quarterly dividend of 87½ cents on \$3.50 cumulative convertible preferred stock.

California Eastern Airways, Inc., Oakland, Calif., reports a net profit, after taxes, of \$948,505 for period ending June 30, compared to \$82,064 for same period in 1951.

Consolidated Vultee Aircraft Corp. San Diego, reports a quarterly dividend of 40 cents a share on outstanding

the first plane to be manufactured in Japan since the end of World War II. Prototype FD-25 will be shipped to Japan soon. The plane carries two .30-cal. machine guns, 2,000 rounds of ammo and rockets. State Dept. has approved the transaction.

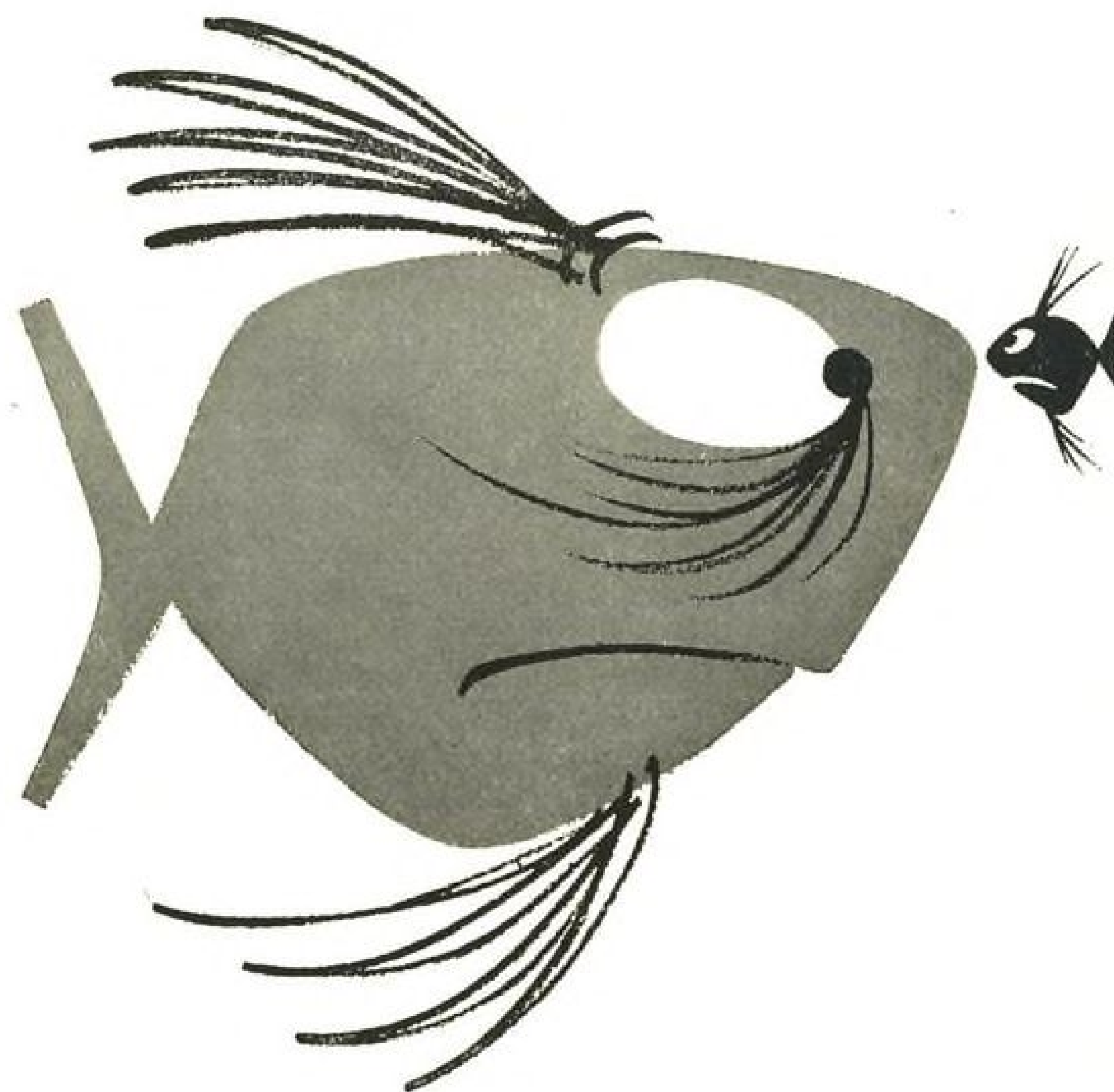
common stock payable Nov. 25 to stockholders of record as of Nov. 14.

International

Japan Air Line was 80 million yen (\$200,000) in the red at the end of September, a year after its formation, despite fact it pays no gasoline consumption tax and has not paid business and fixed property taxes.

Canadian government spending for aircraft equipment and airport construction during the last two weeks of September amounted to \$80 million, according to Department of Defense Production, Ottawa. Orders include: \$66 million for Orenda jet engines to A. V. Roe (Canada) Ltd., Malton, Ont.; \$10,500,000 for three cantilever hangars for RCAF; \$2 million for aircraft repairs, and \$1,500,000 for aircraft training device.

De Havilland will deliver the first jet transport to the Royal Canadian Air Force in England before Christmas and a second in January. Planes will be brought to Canada early in the spring. They will be used for high-speed transport, for familiarization flights by more RCAF crews and exercises to test Canada's defenses against jet aircraft attack.



THERE'S A BIG DIFFERENCE

...in Clamps, too!

The big difference in clamps used in the fabrication of sheet metal riveted and welded sections of aircraft is *precision*. Monogram 3-H Safety Clamps are precision-made to do a precision job and offer many big advantages:

- Needles always uniform.
- Needles maintain true alignment.
- Greater spring tension.
- One piece construction.
- Safe, will not fly apart.
- Sturdier, last longer.
- Proven in 12 years use.

Write today for catalog on the many types and sizes of Monogram 3-H Clamps and applying tools.

MONOGRAM

MANUFACTURING COMPANY
8557 Higuera Street, Culver City, California

3H SAFETY CLAMPS

AVIATION CALENDAR

- Oct. 28-29—Transport Aircraft Hydraulics System Conference, sponsored by Vickers, Inc., Hotel Park Sheraton, Detroit.
- Oct. 28-30—AIEE Air Transport Committee annual meeting, Commodore Perry Hotel, Toledo.
- Oct. 29-31—AIEE conference on machine tools, Ten Eyck Hotel, Albany, N. Y.
- Nov. 6-7—National fuels and lubricants meeting, Society of Automotive Engineers, The Mayo, Tulsa, Okla.
- Nov. 7—IRE symposium on microwave circuitry, Western Union Auditorium, New York.
- Nov. 8—Annual Midwestern Tool Engineering conference, University of Illinois, Urbana, Ill.
- Nov. 11-12—Piper distributors' annual meeting, Lock Haven, Pa.
- Nov. 13-15—Acoustical Society of America symposium on aircraft noise, San Diego, Calif. (For details, write ASA, 57 E. 55 St., New York 22.)
- Nov. 17-20—National Aviation Trades Assn. annual convention, Hollywood-Roosevelt Hotel, Los Angeles.
- Nov. 19-21—Fourth Annual Safety Seminar sponsored by Flight Safety Foundation, Hamilton, Bermuda.
- Dec. 2—Symposium on light-metal heavy forgings and extrusions for aircraft, SAE, ASME, IAS and AIME.
- Dec. 2-5—Aviation Distributors and Manufacturers Assn. tenth annual meeting, The Kenilworth, Miami Beach.
- Dec. 3-5—Society for Experimental Stress Analysis, annual meeting, Hotel McAlpin, New York.
- Dec. 10-12—Joint AIEE-IRE-ACM conference on electronic computers, Park Sheraton Hotel, New York.
- Dec. 17—Annual Wright Bros. dinner, 7:30 p.m., Statler Hotel, Washington, D. C. Wright Bros. lecture to be presented by IAS 3 p.m., U. S. Chamber of Commerce auditorium.
- Jan. 14-16—AIEE-IRE-NBS conference on High Frequency Measurements, Statler Hotel, Washington, D. C.
- Jan. 19-22—Plant Maintenance Conference, Public Auditorium, Cleveland, O.
- Jan. 19-23—Winter general meeting of the American Institute of Electrical Engineers, Hotel Statler, New York, N. Y.

PICTURE CREDITS

9—Levy-Shipp; 13—PAA; 18—Fairchild; 21—Russell Adams; 22—(top) Hawker Siddeley; (bottom) Gloster Aircraft Co.; 35—NACA; 37—Howard Levy.

AVIATION WEEK, October 27, 1952



TAKEOFF of N. Y. Airways' Sikorsky S-55 from the carrier's base at La Guardia Airport Marine Terminal. NYA began daytime, six-day weekly mail service between La Guardia, Newark and Idlewild Airports Oct. 15.

N. Y. Airways Starts Copter Mail Service



MAIL SACKS are loaded for first flight. Left to right: Edward Cavanaugh, N. Y. Commissioner of Marine & Aviation; Assistant Postmaster General Jack Redding; NYA Board Chairman John L. Senior, Jr.; senior mechanic Frank Villacorta; President Robert Cummings, Jr., and designer Igor Sikorsky.



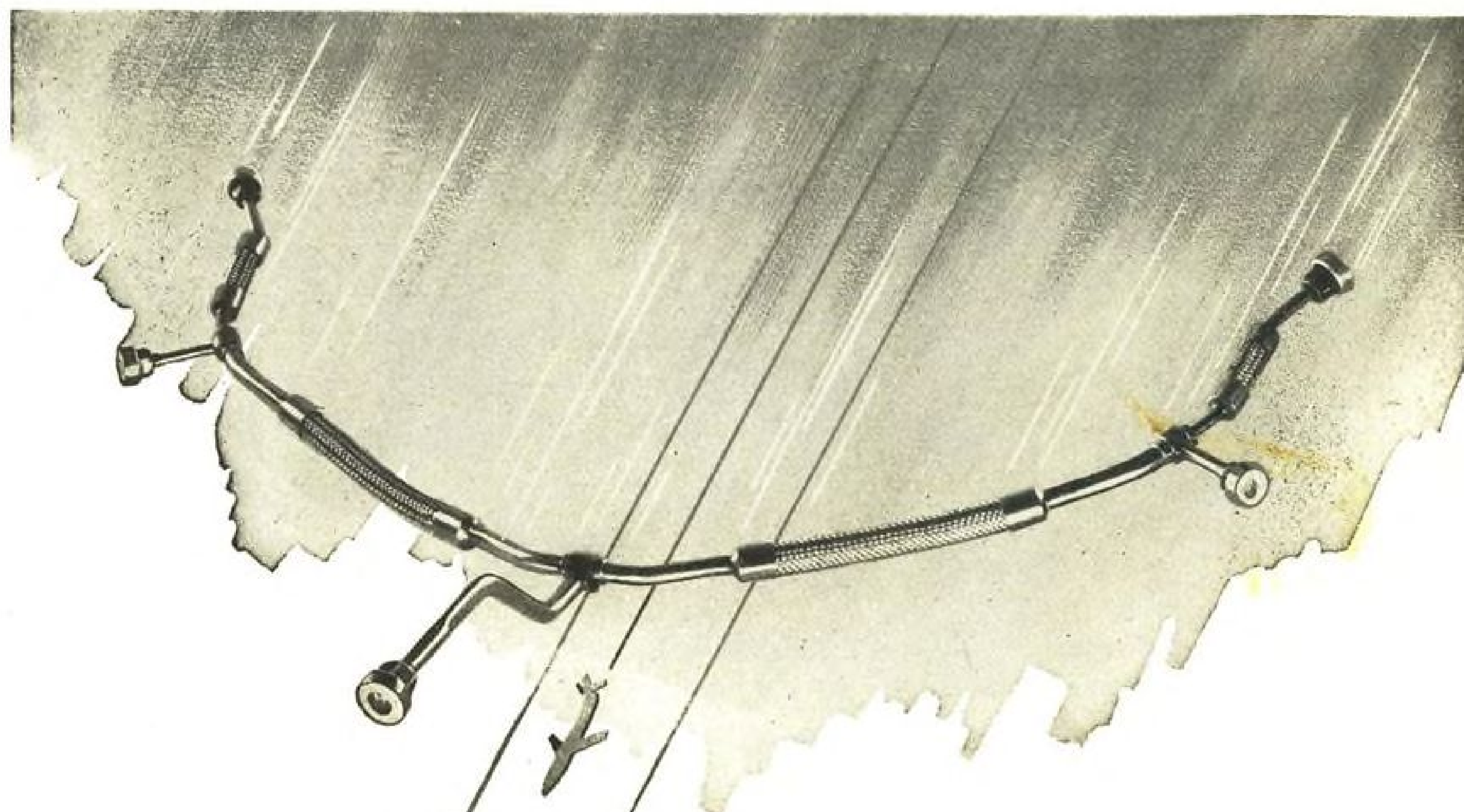
REPORT on weather is handed Chief Pilot Howard Higgins by dispatcher Warren Fucigna. S-55 pilots occupy right seat, co-pilots the left seat. Arrow shows where emergency flotation gear is located. Another bag (inflated) is placed in tail cone.

GROUND STATION equipment features Wilcox receivers and transmitter.



COCKPIT of NYA S-55 showing complete gyro panel for day-and-night operation.





THIS YOKE...

for jet engine condensate drainage
is a result of *Flexonics Engineering*

Among the many complicated aircraft components fabricated by Flexonics Corporation is the condensate drainage yoke illustrated above. The purpose of the yoke is to drain unused fuel that has condensed after a shut down of the power plant.

It's an intricate device, combining flexible stainless steel hose, stainless steel tubing and special connections. Flexonics engineering makes it possible to manufacture these yokes on a production basis to rigid specifications.

Other aircraft components manufactured by Flexonics Corporation include hose of all descriptions, bellows, oil and fuel lines, ducting and connectors of all types and many special assemblies. We would welcome the opportunity to discuss your requirements with you. For recommendations send an outline of your needs.

Flexonics

Corporation

AIRCRAFT DIVISION

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FORMERLY CHICAGO METAL HOSE CORPORATION

Manufacturers of Convolved and Corrugated Flexible Metal Hose in a Variety of Metals • Expansion Joints for Piping Systems • Stainless Steel and Brass Bellows • Flexible Metal Conduit and Armor • Assemblies of These Components
In Canada: Flexonics Corporation of Canada, Ltd., Brampton, Ontario

Flexon identifies products of Flexonics Corporation that have served industry for over 50 years.



WHO'S WHERE

In the Front Office

Arthur E. A. Mueller has replaced Francis M. Higgins as president of Wisconsin Central Air Lines. Mueller has been a WCA director since May. Higgins, head of the carrier since 1944, will continue to be a director.

S. Merrill Skeist has been made vice president of W. L. Maxson Corp., N. Y. C., electronics equipment firm, and placed in charge of the contracts division. Other Maxson appointments: John W. Bjorkman, now executive assistant to the vice president and manager, planning; J. Labarre Comer, staff assistant to the vice president and manager, administrative; William P. McNally, manager of Air Force contracts; John J. Ryan, manager, Navy contracts and Albert J. Colton, manager of the Army contracts dept.

A. N. Abelson has been named vice president-manufacturing of the Aro Equipment Corp., Bryan, Ohio, and will handle all production at Bryan and Cleveland. He joined the company in 1941.

Changes

Dr. James A. J. Bennett, formerly head of the helicopter department of Fairey Aviation Co., Ltd., and internationally known autogiro and copter pioneer, has been named assistant to the chief engineer of Hiller Helicopters, Palo Alto, Calif.

Morris Mokren has been promoted to assistant chief of Engineering and Research Corp.'s Service Engineering dept. at the firm's College Park, Md., offices. William E. Yost, Jr., has been promoted to head Erco publications.

A. E. Abel has been appointed assistant director of engineering and research for the Bendix Radio division of Bendix Aviation Corp., Baltimore, Md., and R. K. Frazier has been named technical assistant to the director of engineering and research.

Frank Gerrard has been designated manager of Oxygen Regulator division of the Zep Aero and Breathing Equipment Co., Los Angeles, and Fred Heckerman has joined the firm as sales engineer covering states west of the Mississippi.

Frank A. Bond and Walter Worrell have joined Steiner Plastics Mfg. Co., Inc., Glen Cove, L. I., N. Y.

Sidney H. Webster has been appointed sales manager of Aviation Engineering Corp., Woodside, L. I., N. Y.

A. V. Pilling has been appointed staff engineer of Hayes Aircraft Corp., Birmingham, Ala., in charge of powerplant and flight test engineering projects.

Martin M. Hunt has been released from the USAF to rejoin Northrop Aircraft, Inc., Hawthorne, Calif., in the customer field service dept.

George Seeburg has been promoted to assistant general manager of the Machine Tool division of Sundstrand Machine Tool Co., Rockford, Ill. T. B. Buell has been made general sales manager in charge of overall sales policies and Harry Leber succeeds Buell as sales manager.

INDUSTRY OBSERVER

► USAF reports that supply of titanium is now outrunning demand with about 100 tons of excess now stocked in warehouses. USAF attributes the surplus to fears that demand would outrun supply and manufacturers' consequent reluctance to commit specific production items to the use of titanium. Current production is running about four tons a day with an increase to eight tons a day scheduled by year's end.

► Rigid military security policy by the Pentagon is credited with eliminating some American manufacturers from the \$400-million fiscal 1953 off-shore aircraft procurement program. Two Italian firms wanted to build Lockheed and Republic night fighters instead of the British Venom but the Air Force refused to release the planes for export. Similarly, the Navy's Bureau of Aeronautics delayed release of the Pratt & Whitney Aircraft J48 turbojet to the French for 18 months and is still kicking around a request from the Bristol Aeroplane Co. in England to buy P&WA T34 turboprops for a civil transport.

► Watch for a Navy design competition for a stripped-down, high-performance jet attack plane. The stripped-down bomber would be carrier-based, carry all loads externally and have a speed equal to current operational fighter types.

► Cessna Aircraft is due to fly its first turbine-powered airplane shortly. It will be an L-19 Bird Dog liaison plane powered by a Boeing 502 gas turbine turning a McCauley aluminum, two-bladed propeller. Delivery of the engine to Cessna was delayed by paperwork involved in the recent transfer of Army aviation from Ordnance to the Transportation Corps.

► Piasecki is nearing completion of its giant XH-16 helicopter at its Morton, Pa., plant.

► Hughes and Bell Aircraft have producibility contracts on the Falcon and Rascal missiles, respectively. These contracts provide for engineering work to prepare the missiles' designs for large-scale production methods.

► First heliport for Army will be built at Fort Eustis, Va., next year. The Army heliport will consist of 34,000 square acres and will be equipped with a control tower, hangars, maintenance and warehouse facilities, fuel storage tanks and night lighting facilities.

► A new model of Wright Aeronautical's Turbo-Compound—R3350-32W—recently passed Navy acceptance test of 3,700 hp., with water injection. Highest released previous rating for Turbo-Compound was 3,500 hp. with water injection.

► Firestone Tire & Rubber Co. has received production order for Corporal E guided missile. This Army Ordnance ground-to-ground weapon, based on work done at Guggenheim Aeronautical Laboratory at Caltech, may be the atomic-warhead missile to which the Army recently referred.

► Republic Aviation is investigating General Electric J73 engine as possible future replacement for the F-84F's J65 powerplant, built by Curtiss-Wright. Using "shoe horn" techniques, GE can fit the J73 into the F-84F without major airframe changes. Republic is also investigating Westinghouse and Allison engines. Observers estimate that earliest possible switch of F-84F to the J73 would be early 1954.

► Harry O. King, New York business executive, is heading a committee at Wright-Patterson AFB working out new policies for procurement of parts and spares. Committee was appointed as a result of congressional objections that approximately 60% of the cost of a plane are for parts, spares and equipment.

► Boeing is working on methods to eliminate Rato takeoffs for the B-47, according to J. E. Schaefer, vice president and general manager of the Wichita division. Schaefer says 18 Rato bottles now used are too heavy and expensive for efficient operations. More powerful jet engines with afterburners are planned to provide additional B-47 takeoff power. Trail-edge of wing will be strengthened as a consequence.

Washington Roundup

Weapons Evaluation

Pressure is developing for greater participation by the Pentagon's top civilian command in deciding what planes, guided missiles and other weapons the military services should be permitted to develop and operate.

Irritated with loose direction of the military supply program, Congress this year gave the Secretary of Defense all-out authority over procurement and production. He promptly passed it on to the chairman of the Munitions Board, who for the first time was given power of decision, subject only to the Secretary's approval.

Now the feeling is increasing among political leaders that the Defense Department's weapons evaluation program is being loosely directed, that each of the services is branching out in all directions, and that topside authority to "hold them down" is badly needed.

All weapons evaluation now comes under the Joint Chiefs of Staff: Each service has its own program, and the Weapons Systems Evaluation Group, established by the late Secretary James Forrestal for technical and operational evaluation on an inter-service basis, is an arm of JCS in which each service has an equal voice.

Here are indications of the growing move to bring outside direction into weapons evaluation:

- **House Appropriations Committee**men feel that the result of the present setup is that each service gets pretty much what it wants. The group is likely to slash defense money next year to pressure the Pentagon into more careful selection of weapons.

- **Senate Preparedness Subcommittee** has called on Defense Secretary Robert Lovett to appoint a committee of military men and civilians to re-evaluate the composition of the armed services.

- **Gen. Dwight Eisenhower** expressed the views of many Democrats, as well as Republicans, in Congress in his address declaring:

"We cannot pretend to do everything in every field all the time. . . . For this reason, our judgment in weapons development must be sure and sound. . . . Whenever a new weapon comes from the laboratories, all services—sometimes understandably—demand the right to use it. Stranger than this is the almost inevitable demand of each service to do the research, development and production work on new weapons."

He recommended: a civilian-military group for "prompt adjudication among the services—otherwise you will find all three engaged in spending public money for a single need."

- **Dr. Vannevar Bush**, wartime chief of government research, has proposed that the Joint Chiefs be separated from their service posts and act exclusively as advisers to the Defense Secretary to bring more impartial overall direction into the armed services' weapons program.

Political Notes

Sen. Joseph O'Mahoney, chairman of Senate Appropriations Subcommittee on the Armed Services and one of the Air Force's best and most influential friends on Capitol Hill, has strong opposition for re-election in Wyoming. His opponent, Gov. Frank Barrett, was confident enough of winning to cut short his governorship, which doesn't expire until 1955, to challenge O'Mahoney.

Since the years before World War II, O'Mahoney has fought for funds for land-based air power. In the last

session, he led a successful fight against cutting funds for the 143-wing USAF program, and a half-successful fight to permit Aro, Inc., target of congressional charges of mismanagement and profiteering, to operate the Arnold Engineering Development Center (company can operate AEDC to Mar. 31).

On key issues he sided with the scheduled airlines, voting against permitting national defense subsidies to certificated irregular carriers and against a rigid formula for mail pay over international routes.

Henry Cabot Lodge already is mentioned as a prospect for Secretary of Defense if Eisenhower is elected. He is engaged in a stiff battle for re-election. Along with Texas Sen. Lyndon Johnson, Lodge led congressional opposition to emphasis on "butter" instead of "guns" in the mobilization program, particularly the air program. He launched the drive for the 143-wing USAF buildup with Senate speeches demanding a vast expansion of tactical air for NATO. Lodge supported national defense subsidies for certificated irregular carriers and a lenient formula for mail pay to international carriers.

Rep. John Kennedy, Lodge's opponent, is best known to aviation circles for his unrelenting battle of several years for a rigid formula for determining mail pay to airlines. He has favored opening the subsidy field to the nonscheduled carriers.

In the last session, Kennedy went Lodge one better and attempted to have procurement money for the 143-wing program increased from the \$12 billion approved by Defense Department to the \$13 billion USAF wanted.

Sen. Owen Brewster, defeated for re-election in Maine, is counted on for a top post in event of a Republican administration, possibly Secretary for Air. Since his defeat, Brewster has demonstrated the party spirit, campaigning energetically for Gov. Frederick Payne, who won the Republican nomination from him, and for the Eisenhower ticket. He was chairman of the 1948 Congressional Aviation Policy Board.

Rep. Albert Gore, almost certain to win the Senate seat from Tennessee, isn't expected to put much push behind his case against Aro, Inc., next year. He has hinted he will leave to House and Senate Armed Services Committees the decision as to how AEDC should be operated and to General Accounting Office action on any improper payments to Aro.

Sen. James Kem is using material Gore developed against Aro in his Missouri Senate contest with Stuart Symington, the Democratic nominee. As Secretary for Air, Symington unilaterally decided to turn operation of AEDC over to Aro.

Charges of mismanagement and waste of tax dollars at the Tennessee installation were popular campaign material for Gore in the primary. But his attack was not aimed at Symington, whom he gave a clean bill. In the last session, Kem was supporting the airmail subsidy separation legislation endorsed by the scheduled airlines.

Sen. John Bricker, critic of Civil Aeronautics Administration's air safety program, is given big odds to win re-election over his Democratic opponent, former Price Stabilizer Mike DiSalle.

Sen. John Williams, who energetically fought to hold down subsidies to airlines, as well as for all other purposes, is in a close fight for re-election with Alexis Dupont Bayard in Delaware. Williams favored making certificated irregulars, as well as the scheduled lines, eligible for national defense support.

—Katherine Johnsen

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PAA'S COMET 3 JET CLIPPER, shown in preliminary model form wearing the carrier's colors, will seat 58 first-class or 78 tourist.

PAA Signs Firm Contract for Comet 3

- **Carrier 'buys British' after U. S. makers say their jet transports will not meet 1956 delivery date.**
- **New craft, not yet built, may see first PAA service on competitive route from New York to Buenos Aires.**

Pan American World Airways moved last week to meet its jet-propelled competition by ordering three de Havilland Series 3 Comets and taking an option on seven more.

The Pan American order was the first United States airline order for a foreign-designed plane since the Fokker trimotors of the early 1930s. It was a firm contract signed in London by Franklin Gledhill, PAA vice president for materiel and personnel, with de Havilland guaranteeing delivery by the end of 1956. The option for an additional seven Comets must be exercised at the time of the first delivery to PAA and schedules the additional deliveries for 1957. Pan American will get three of the first six Comet 3s to come off the de Havilland production line. Other three will go to BOAC.

Juan Trippe, PAA president, has had

an option on the trio of Comet 3s since last summer and ordered Gledhill to sign the firm contract on the last day before this option expired. The PAA decision was approved by its board of directors. PAA will pay about \$2.1 million for each Comet 3 plus the cost of American-type equipment that will be installed.

► **South American Plans**—Although PAA would not comment on where it planned to put the Comets into service it was expected they would be used on the New York-Buenos Aires run where PAA will get jet competition from LAV, the Venezuelan airline that has a pair of Comet 2s on order. PAA estimated it could make the 6,300-mi. flight in 19 hr., 9 min., cutting approximately 10 hr. from its current Stratocruiser schedules. The jet route would run via a 1,600-mi. leg from New York to San

Juan, Puerto Rico; 1,890 mi. to Belem; 1,523 mi. to Rio and a 1,260-mi. hop to Buenos Aires.

The Pan American version of the Comet 3 is guaranteed for a stage length of 2,700 statute mi. with a full cabin load of 14,500 lb. operating against a 50-mph. headwind with reserves sufficient to reach an alternate airport 200 mi. distant after 45 min. stacking time. It will carry 9,700 U.S. gal. of fuel in internal and external wing tanks.

PAA will require installation of track seating in its Comets that will make them readily convertible from 58-passenger first-class service to 78-passenger high-density operations.

► **Specs Confirmed**—Specifications of the Comet 3 announced by Pan American are essentially the same as those published exclusively by AVIATION WEEK Oct. 6. PAA has a guaranteed range 300 mi. less than de Havilland's maximum estimate for the Comet 3 and plans to seat two less passengers in its first-class version and six less in the high-density version than the maximum possible.

Once the decision to buy the Comets was made, PAA officials moved swiftly

More U.K. Funds for Comet 3

London—The Comet 3 will have a much bigger government subsidy behind it than its two predecessors had.

• The Ministry of Supply is preparing to draw up a contract for the Comet 3 prototype which will include all development costs of the aircraft. The contract follows the lines of MoS contract with Bristol Aeroplane, Ltd. for the Britannia. No figures have been mentioned for either contract yet.

• So far as Comet development is concerned, this is a change of form for MoS. The government agency backed the Series 1 and Series 2 Comets with £1.5 million (\$4.2 million). Approximately a third of this money covered the "normal commercial price" paid for the first

two series prototypes. (This price, set many months before the Series 1 flew, was obviously way below D-H's cost on the prototype project.)

• About two-thirds of the original \$4.2-million subsidy covered development and purchase of the first Series 2 prototypes. This procedure is now standardized in the Comet 3 and Britannia contracts. But these contracts will entail "very much more money." Reason: Development from the Series 1 to the Series 2 Comet is relatively minor—merely a stretched fuselage (engine development being strictly military). But the jump to the Series 3 will be relatively big. Both D-H and MoS refer to the Series 3 as "essentially a new aircraft."

Red Air Buildup

• Finletter sees signs of new Korean offensive.

• Nest of twin-jet bombers reported in Manchuria.

There are increasing signs in Korea that the Communist air forces may make another attempt to gain air superiority and take the offensive in the air war, Thomas K. Finletter, Secretary of the Air Force, said last week after his return from a 'round-the-world inspection flight.

Finletter said the Red air forces had just about doubled their strength in Manchuria during the past 12 months and now had about 2,500 aircraft of which at least 1,300 were jet fighters—mostly MiG-15s. When the Reds made their first bid for control of MiG Alley they had about 1,300 planes, of which 700 were jet fighters.

► Russian Investment—Total Russian investment in both the Chinese and North Korean air forces during the last year has been about 4,400 planes of which 4,000 have gone to the Chinese. About 2,000 new jet aircraft have been shipped to Manchuria during the past years to replace combat and operational losses and bring the Communist air strength to its current level.

Finletter said USAF fighters have destroyed 458 MiG-15 aircraft since they first appeared in Korea in November 1950 and have damaged 643, including many planes that eventually were total losses. USAF calculates that the Chinese have lost an additional 325 MiG-15s through normal accidents that accompany training and combat operations.

Finletter said that since the bitter air battles of last fall for control of MiG Alley, the Communist air forces have relapsed into a strictly defensive effort during which their loss rate has increased as a result of an increase in the quality and quantity of USAF F-86 Sabres operating against the MiGs. In addition to the numerical increase of Communist aircraft in Manchuria, Finletter also cited the recent transfer of a sizable quantity of twin-jet bombers to the Russian Far East air force in Siberia where they would be readily available to the Chinese.

► New Red Weapon—"This aircraft has the range to penetrate behind our present lines," Finletter said. "It is distinctly an offensive weapon. Whether these fast jet bombers have actually been turned over to the Chinese air force is uncertain.

"Possibly as was done earlier with the MiGs, the intention of the Communists is to train the Chinese airmen in

their use before making the actual transfer. The fact remains that a new and potentially dangerous factor has now intruded on the other side of the Korean equation."

Finletter said that USAF air strength in Korea has been increased to meet this threat by bringing combat groups already on the scene up to full strength and by adding several new groups of Republic F-84 fighter-bombers to the Far East Air Force.

O'Konski Opens New Fight on Kaiser

Rep. Alvin O'Konski has fired another round in his campaign against Kaiser-Frazer Corp., charging the firm with profiteering on defense work.

"K-F has lost huge sums on its automotive operations," the Wisconsin Republican declared. "But they continue to announce and predict large profits on defense work. The only conceivable explanation for this discrepancy is that these defense contracts are let at exorbitant prices."

He requested an explanation from Secretary of Defense Robert Lovett of "the nature and amount of this defense work; what prices were paid for it; what prices were paid to other contractors for comparable work; where was this work performed and what portion of this work has actually been received and accepted by the government."

Commenting that "it now appears" that K-F is seeking "still further favors" from Reconstruction Finance Corp., O'Konski also requested RFC Administrator Harry McDonald for "assurances" that no further loans would be granted to the corporation. To do so, he said, "would be a betrayal of public trust."

A spokesman for K-F declined to comment on the congressman's latest charge, stating that the corporation previously had answered his charges.

Sayen Victory Assured in ALPA

Chicago—Even before the Air Line Pilots Assn. began its annual convention here last Monday, Clarence N. Sayen could count on being re-elected president.

Shortly before the meeting opened, the U.S. Circuit Court of Appeals ruled that ALPA's founder and former president, David L. Behncke, had legally been ousted from his post in 1951 (AVIATION WEEK July 23, 1951).

Although this meant another defeat for Behncke in his two-year fight to regain control of the association, the decision still left the case open by directing the Federal District Court to look into some other recommendations

of the Special Master who had investigated the issue. These recommendations had not been considered when the lower courts upheld Behncke.

Another early prediction was that proposals to withdraw from the American Federation of Labor would be overridden. Observers based their forecasts on a committee recommendation for the affiliation to continue and for ALPA to take a more active part in union matters.

A movement to transfer ALPA's headquarters from its big new building in Chicago ("the house that Behncke built") to New York was being promoted actively among the 225 delegates. But this shift is expected to hinge on prior disposal of the Chicago building.

► Safety Unit—Under discussion was establishment of an annual Air Safety Congress to meet each March. The congress would consist of at least one safety representative from each airline's pilot membership plus other ALPA members working on special safety projects. Invitations would be extended to other groups interested in flying safety, including airframe engine and equipment companies.

Proposals also up for discussion:

• For a standard left-hand traffic pattern within a defined control zone at all airports, varying only by special clearance from air traffic control.

• For a considerable revision of ALPA constitution and by-laws aimed to insure that no chief executive in the future could have the so-called "despotic" powers that one-time president Behncke is accused of assuming.

• Revision of present landing and take-off minimum procedures prior to establishing experimental minimums for evaluating new low approach navigational facilities.

• To make pilot seniority on any airline a simple matter of date of employment. This would give older pilots, mainly on the larger carriers, a seniority advantage over pilots of smaller new lines in event of mergers. —A. McS.

Negotiators Settle Douglas Wage Dispute

Negotiators for Douglas Aircraft and AFL International Association of Machinists Lodge 720 last week settled the wage dispute which caused a two-week strike last month at the El Segundo plant.

The agreement, granting a 5-cent hourly wage increase and some fringe benefits, was subject to ratification by the local union membership a week later.

Both Douglas and the union were saying little publicly about the terms reached in Washington with the assistance of the Federal Mediation and Conciliation Service, to avoid misunderstanding which might cause the membership to reject them. One of the reasons is that Lodge 720 had struck on Sept. 15 rather than accept Douglas' 5-cent offer.

Union negotiators insist the settlement is a "substantial improvement" over Douglas' earlier offer.

The settlement, AVIATION WEEK learned, gave Douglas workers a top rate of \$2.38 an hour, seven cents above the top rate in North American Aviation's new contract with CIO United Auto Workers. Cost-of-living increases, under a General Motors-type escalator, will go into the basic wage rates and raise the maximum job rates, rather than being paid as a bonus. Douglas also agreed to automatic progression of five cents an hour every 16 weeks, up to the maximum job rate.

Safety Council Appoints

J. H. Waterman, manager of ground safety for Trans World Airlines, Kansas City, was elected chairman of the Air Transport section of the National Safety Council at Chicago, succeeding Robert Porter, industrial safety supervisor of American Airlines, Tulsa.



MYSTERE BUILT FOR TWO

Prototype Marcel Dassault all-weather fighter, which differs from basic MD-450 airframe in seating two and having side intakes for its Hisso Tay jet engine. The MD-450

is a single-seater and has a nose intake. Designed to operate at sonic speed the two-placer has a weight of approximately 18,000 lb.

CAB Gets New Safety Proposals

Regulations to end prop reversal hazard are high on safety bureau list, but aft-facing seats will wait.

By Alexander McSurely

New safety regulations aimed at reducing the hazard of inadvertent propeller reversals and attacking other important aviation problems were recommended last week to Civil Aeronautics Board by its Bureau of Safety Regulation, which invited comments from any interested parties before final CAB action.

The new proposals were drafted from discussions between the bureau's technical representatives and those from airlines, manufacturers, user groups and Civil Aeronautics Administration at the August Airworthiness Regulations Review (AVIATION WEEK Aug. 11, p. 46).

John S. Chamberlain, CAB safety regulation director, set a Nov. 24 deadline for comments, which should be sent to the bureau in Washington. Board action on the proposals may be completed before year's end.

Some vital aviation safety problems for which new or changed regulations are proposed involve anti-collision lights, humidity-temperature accountability, ditching procedures, engine endurance tests, helicopter fire protection provisions.

► **No Action Now**—The bureau passed for future attention some items on which controversy was greatest over the proper regulatory approach. These include a rearward-facing seat proposal, and "drift down" procedures for medium transports.

► **Reversal Indicator**—In order to give the pilot warning if the propellers should inadvertently be reversed, the bureau proposes an amendment to Part 4B.604 (N) recommending: "a means for each reversing propeller to indicate to the pilot when the propeller is in reverse pitch."

In proposing the indicator the bureau said it believes that dependability of all equipment on the airplane should be such as not to require additional safety provisions such as warning devices. In this instance, however, compliance with the proposed rule would be relatively easy and contribute materially to safety. Recent experience indicates that a propeller reversal thrust warning device would be of considerable value to the crew in an emergency.

The amendment applies only to new airplane types and does not affect currently operating transports under its present status. However, a CAA request

to CAB would make such indicators mandatory on today's planes. There may be further consideration of some retroactive action.

► **Humidity-Temperature Accountability**—Problem of determining takeoff weights in varying conditions of temperature and humidity has been one of controversy for several years. Current regulations call for the temperature factor to be figured in takeoff up to the point where the airplane gets over the imaginary 50-ft. obstacle. But the only humidity accountability regulation provides for a factor of 80% humidity to be figured into the airplane's takeoff performance for new airplane certification.

The bureau contends that experience of pilots predominantly tends to reveal marginal safety of takeoff in high temperature and humidity conditions.

A new proposal has been drafted for further comment before Board action. It would extend the temperature correction to a point at the end of the runway.

It also would provide that both old and new airplanes will be subject to accountability for humidity as encountered operationally and must then limit load as required for conditions on particular landings and takeoffs. The overall 80% humidity requirement for new plane certification would be dropped.

► **Anti-Collision Lights**—Flashing frequency of airplane position lights would be stepped up to 65-85 cycles/min. instead of the 36-60 cycles/min. now required. Provision is made for use of red anti-collision lights on the tailfin or top of fuselage.

The bureau says that red was specified because it is considered most effective and distinctive. But the special regulation making the new light optional is intended to put other limits on the broad scope of experimentation with this new device. The special regulation provides for a rotating beacon type light of 40-100 cycles/min., with an on-off ratio between 1:25 and 1:75. It is not to be detrimental to the crew's vision and not to "detract from the conspicuity of the position lights."

► **Accents Industry View**—A new proposal for engine endurance tests is designed to represent the industry view of making a more varied engine test, instead of the CAA view to lengthen the test from 150 to 200 hr. duration. The proposal which would be an amend-

ment to CAR Part 13, sets up a requirement for each of three types of aircraft engines—single-speed, two-speed supercharged and helicopter. Each of these three categories would run a prescribed 150-hr. test, consisting of short runs at various speed and power settings, including takeoff, maximum continuous power and speed, maximum "best" economy speed or maximum recommended cruising speed, and various percentages of maximum continuous power and speed.

The single-speed engine tests varied from 91% down to 50%. Two-speed engines will be tested under both speed conditions, and helicopter engine tests are specially designed to get in over-speed conditions.

► **Ditching Regulations**—Although the CAB Safety Bureau already has circulated a special new regulatory proposal for ditching equipment requirements for planes operating over water (AVIATION WEEK Sept. 15, p. 16), additional action aimed at making forced landings on water safer was proposed in the new list.

This should eliminate an old regulation which permitted over-water operation by planes of certain construction without life rafts and ditching equipment. CAB safety engineers said that the old requirement for airplanes which could remain afloat "indefinitely" with sufficient cabin capacity above water to house the passengers was a question impossible to interpret.

Elimination of the regulation is accomplished by the proposed combination of old Part 4B.261 into a new Part 4B.361. In effect, it means that every plane receiving a ditching certificate for over-water operation will have to carry the life rafts and ditching equipment provided for in other sections, plus presumably other equipment asked for in the new September proposal.

► **Ventilation**—Acting in response to pilot complaints about airplane ventilation, the bureau has included a proposed requirement that air from the passenger cabin shall not be re-circulated through the cockpit, and that separate ventilation controls shall be provided for main passenger cabins and for cockpit.

► **Engine Fire Protection**—All new airplanes will be required to have fire extinguishers in engine nacelle Zone 1 and fireproof nacelle skin in Zone 3, under another proposed change in regulations. All airplanes manufactured after Oct. 1, 1953, would be required to have either Zone 1 extinguishers or the Zone 3 fireproof nacelle skin. Also all airplanes manufactured after Oct. 1 would be required to have fire-resistant lines incorporated in their propeller feathering systems.

► **Helicopter Proposals**—The bureau scrapped a CAA proposal for setting up

a separate helicopter transport category as premature, and similarly ignored proposals for changing the technical definition of hovering.

Another CAA proposal for considering helicopter crash load factor separately for forward, side and up-loads in tests was thrown out on the theory that the loads are all applied simultaneously in an actual crash and should be tested that way.

Carried over for further study in the 1953 Airworthiness Review is the present requirement for landing load criteria, which is based mainly on nose-wheel helicopter gears, such as are used by virtually all the machines currently commercially certificated. Several of the possible future certificated machines, the Piasecki HUP design, the larger Piasecki XH-16, the McDonnell Little Henry ramjet and others, have tailwheel landing gears.

Other action on helicopters proposed:

- Reduce minimum maneuvering limit load factor from 2.5 to 2.
- Change requirement for centrifugal load on auxiliary rotors to the load resulting from operating engine at maximum design rotor speed, not twice the speed as heretofore.
- Allow a rotor lift equal to half the design gross weight of the helicopter in making power-off landings, instead of two-thirds the gross weight as heretofore.
- Provide new requirements for firewalls or shrouds on the general theory that the engine compartment and sources of fire should be shut off from the rest of the machine, not isolating the passenger compartment as was the previous theory.

Also, provide requirements for fire extinguisher system on helicopter engines of more than 1,200-cu.-in displacement, with "one-shot, two-shot" extinguishers for multi-engine configurations so that both extinguishing charges can be fired at one engine if necessary.

► **Rearward Seats**—In passing up the regulation requiring rearward-facing seating, the bureau reflected a growing technical viewpoint that it is more important to make the seats strong enough to withstand front, back and side loads, than to face them either fore or aft. Studies now being conducted have not progressed far enough to reach definite conclusions, the bureau said.

► **Drift Down**—A proposal by one of the airlines, which has some opposition from airline pilots, was passed over for future consideration. It asked for a provision on one-engine-out performance that would authorize the airplane to figure into its loading its ability to fly 2,000 ft. over the highest point on its route, whether the altitude over the high point was by "drift down" from a higher altitude maintained for this factor or whether the altitude was due to actual one-engine-out performance.

Aircoach Grows

• Major airlines report their expansion plans.

• Announcement coincides with nonsked hearings.

The major airlines say they are going in for aircoach this winter as never before. By an odd coincidence, they all chose the Civil Aeronautics Administration's nonsked airline investigation hearings as the place to announce their coach expansion plans—especially American, TWA and United.

Here are highlights of their carefully timed joint barrage; it is aimed to knock down the nonsked airlines' claim of a right to normal business expansion with demand in this field, which they developed exclusively from 1946 to 1949—before the certificated lines started to enter that market:

- **TWA will convert** nine more Constellations to 81-passenger coaches, making 19 coach Connies and four coach DC-4s in service by next spring. Market value of this fleet is estimated at about \$25 million.

- **American will convert** its six 70-passenger DC-6 coaches plus four more standard 50-passenger DC-6s to 80-passenger coaches. American says it now believes aircoach is its major field for expansion from now on, that the first-class market is near saturation (AVIATION WEEK Oct. 20, p. 87).

- **National Airlines** is expanding coach service now for the winter season, will operate six DC-4s and one DC-6 in coach. National plans further coach expansion next year.

- **United Air Lines**, long skeptical about the coach market, suddenly has decided to convert up to 17 DC-6s to coach.



READY FOR ASSIGNMENT

A considerable number of 600-mph.-plus Boeing B-47 Stratojet bombers shown on the flight line at Wichita, Kans., being readied for delivery to USAF medium bomber units.

Timing and number of conversions depend on a current survey of the airline's coach market potential, says United President W. A. Patterson. It operates only DC-4s in coach service now; they started on the West Coast seven years ago because of pressure of competition. Last year United tried transcontinental coach service at the behest of CAB. It had mediocre results for a while because of low-pressure promotion and faster competitive TWA service.

But United's coach has done better this summer, and the recent swing of the entire scheduled airline industry into enthusiastic coach expansion programs apparently has decided the company to go in for it with more vim than before. Only two months ago, a spokesman says, the company still had no plans for such an expansion.

- **Northwest Airlines** expanded its DC-4 coach service recently, but awaits re-evaluation of its entire equipment program under its new president, Harold R. Harris, before firming up future coach projects. Northwest presently opposes the PanAm proposal to start trans-Pacific aircoach.

- **Capital's Problem**—Capital Airlines tentatively plans daylight coach operation as soon as final Constellation deliveries free its DC-4s for conversion to coach seating. It is a shorthaul airline, so coach is not so easy for Capital to program as for the longhaul carriers like American, TWA and United. American, for instance, says shorthaul coach would upset its fare structure.

Yet Capital—pioneer of off-hours coach operation—is now watching Northwest Airlines' new Detroit-Cleveland-Pittsburgh-Washington aircoach. Capital plans ultimately to enter the daylight coach field first on competitive routes: Northwest's Detroit-Washington, TWA's New York-Pittsburgh, and AA's ultimately expected New York-Detroit-Chicago coach service.

Sand Spit Crash

- Pilots, NWA officials dispute CAB findings.
- They say cause of fatal water landing unknown.

Pilots and operations officials of Northwest Airlines have challenged the Civil Aeronautics Board report that "probable cause" of the Jan. 19 Northwest DC-4 crash off Sand Spit, B. C., fatal to 36 of 43 aboard, "was the high approach to the airstrip and the attempt to again become airborne at insufficient airspeed, which resulted in the aircraft settling into the water."

Cause of this accident is completely unknown, say the Air Line Pilots Assn. and some NWA operations officers. Details of CAB evidence on the crash appeared in AVIATION WEEK, May 12, p. 84.

A top company officer in a confidential correspondence challenges the CAB assumptions in this report point by point. He concludes that:

- The "high approach" stated by CAB as one cause of the accident is not substantiated by the evidence and would not be a "cause" of the accident anyway.

- The "attempt to become airborne," stated by CAB as the other cause of the accident, was not an "attempt"; the plane, the Northwest officer says, "was airborne and under control, and for some unknown reason was unable to fly, and struck the water three-fourths of a mi. from the end of the runway."

In this accident, a TWA DC-4 operated by Northwest on the Pacific Air-lift, was returning from Tokyo to Seattle via Alaska. Halfway from Alaska to Seattle the No. 4 engine quit. Here, the pilot told a passenger, Lt. Donald Baker, that he would prefer to go on to Seattle but that company rules required him to land at the "first available airport," which was a small emergency airstrip—aptly named "Sand Spit."

The runway was lighted only by flare-pots because three-ft. snowbanks covered the regular lighting system. There is a question whether the far end of the runway was marked at all. Braking conditions were reported "fair" with light snow. Pilot touched down and then took off again for another approach.

The plane hit water, bounced, and ended up almost one mi. from the runway end. Although many seats tore loose, all, or almost all, 43 aboard got out. But by the time the plane lodged on a sandbar with only one wing out,

only seven survived the 45-min. wait before rescue.

The engine that failed originally had run 225 hr. overtime on its nose section, crankcase assemblies, rear accessory section, magnetos and ignition harness because of a stock-clerk error on transfer of that engine from TWA to Northwest.

The CAB report attempts to analyze the "probable cause" of the crash.

- Hits CAB Analysis—A Northwest operations officer and ALPA pilot group criticize many points in the CAB report on this crash, including:

- Picking Sand Spit. CAB reports: "In accordance with company operating procedures, the captain elected to land at the first available airport. . . ." These are based on strict interpretation of Civil Air Regulations, Northwest points out, and adds that the pilot followed the rules strictly because "failure to follow CAR results often in civil penalty to the pilot." The ALPA spokesman also says that "the CAB report deletes the fact that the pilot was never informed by CAA Communications that our dispatcher in Seattle had sent him a message that the weather in Seattle was clear and expected to remain clear. This alone would help to make up his mind to continue or land."

- High approach. Northwest points out that the two ground observers could not tell whether the approach was high, or accurately tell how far down the runway the plane landed. Three-ft. snowbanks plus an old building obscured their view. In addition, "an observer watching an airplane land at night without obstructions and with good contact lights normally cannot fix

the exact point of touchdown and usually cannot tell it within 1,000 ft."

- Takeoff "attempt." Similarly, Northwest comment agrees with a pilot's statement that "the (same two) witnesses who saw the plane take off couldn't possibly have told how high he was at the end of the runway, and I am sure that the tires don't leave marks in the air." It is added that the CAB report says the plane barely cleared a low fence and driftwood piled two ft. high at the runway end. However, pilots who visited the scene say there was a snowbank at least three ft. high at the end of the runway and the driftwood and fence were another 300 ft. beyond the runway end.

- "Insufficient airspeed." Normal take-off practice is wheels up, flaps 20 degrees. Wheels were found "definitely" up and flap handle in "neutral," as the CAB report notes. Divers could not get a good view but estimated by feel that the right wing flap was down "about 40 deg." But pilots state that flaps are supposed to break loose on ditching impact. The Northwest official comments that "obviously the gear would have been retracted immediately on becoming airborne and the flaps raised likewise. It therefore does not seem logical to presume that there was a high angle of attack under the circumstances, or that an adequate rate of climb was not maintained after the gear and flaps were retracted."

He concludes by saying: "There are perhaps many other points of equal significance. . . . the picture actually proves that there are many unknown factors which likely resulted in the accident."

West Germans Plan Aircraft Production

(McGraw-Hill World News)

Bremen—New signs of rejuvenation of the German aircraft industry are indicated in plans of the Focke-Wulf aircraft works to resume construction of powered aircraft as soon as the Allied ban on building such planes is lifted, according to VWD, the West German economic news agency.

It also was reported that the well-known German designer, Willy Messerschmitt is considering the possibility of aircraft construction in Essen where plans are being discussed with city officials to build an assembly plant and factory for aircraft parts, VWD says.

The Focke-Wulf works here has been rebuilt to such an extent that the production of parts for aircraft could be resumed without difficulty. The plant now employs some of its former skilled workers in glider production and has produced 16 gliders since June.



C-119 ESCAPE CHUTE

Newest safety feature added to the Fairchild C-119 series is this personnel escape chute behind and below the pilot's seat. The new hatch is going into all production C-119s including the new C-119H.

VISIBILITY by Swedlow



NORTH AMERICAN F-86



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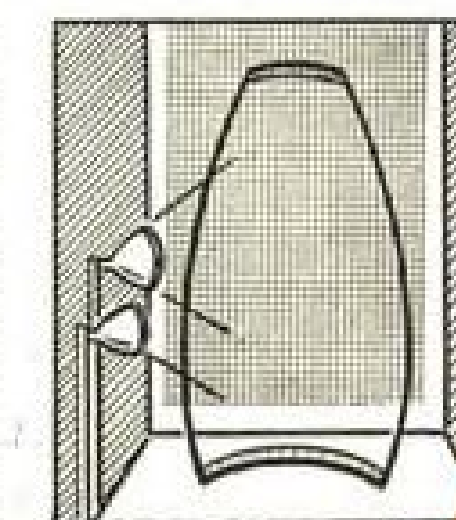
REPUBLIC F-84



BOEING B-47

Perfection in Optical Qualities

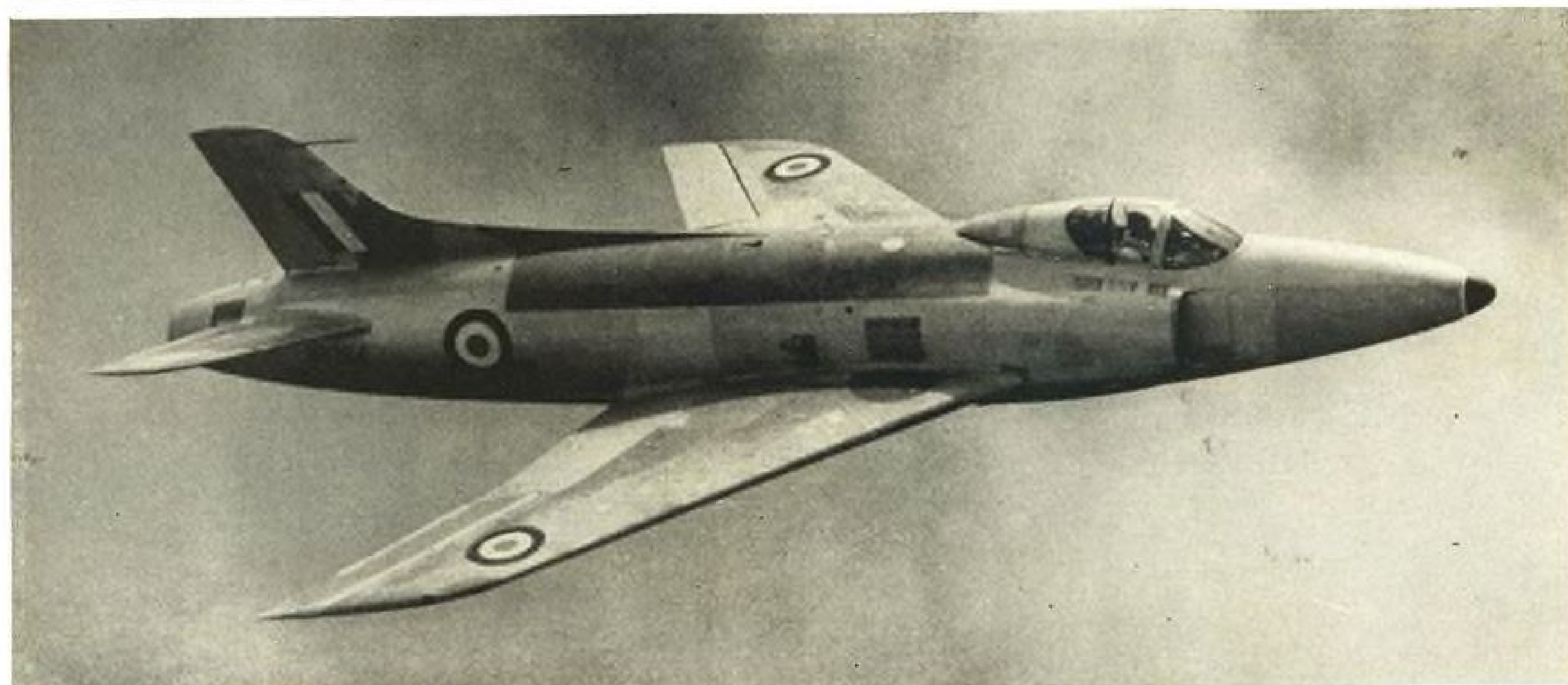
has made SWEDLOW transparent acrylic canopies virtually the standard of the aircraft industry. Fifteen years of specialization in the fabricating of transparent plastics, plus exacting inspection requirements, have gained for SWEDLOW the complete confidence of the aircraft industry. A few of the outstanding applications of SWEDLOW-made acrylics to aircraft are shown above. We shall be glad to assign staff engineers to work with you on your specific requirements in fabricated acrylics.



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PRODUCTION ENGINEERING



SUPERMARINE SWIFT makes considerable use of U. S. mass production methods, giving it a head start on the . . .

Britain Gets Set to Produce Its Aces

- Two new transonic fighters by Supermarine, Hawker have been awarded top priority production status.
- Companies took different approaches in setting up design and production criteria for Swift and Hunter.

By David A. Anderton

London—There are two sides to the important aircraft production story in England today.

One side is typified by the Vickers Supermarine Swift, sweptwing Avon-powered fighter for the Royal Air Force. Built in large measure of high-strength aluminum alloy, the Swift design calls for many complex parts machined to close tolerances and fine finishes. It is an Americanized production design in many ways.

The other side is typified by the Hawker Hunter, sweptwing Avon-powered fighter for the RAF. The Hunter is built with a minimum of machined parts. Conventional framing and skinning techniques apply; no high-strength aluminum alloys are used. A superlative surface finish on the entire aircraft puts the final touches on a product of traditional British craftsmanship.

► **Powerful Pair**—There is little to choose from between the two airplanes. They both have transonic performance potential. They both carry the heavy punch of four 30-mm. cannon. They both enjoy a super-priority production

rating. They both stem indirectly from a long line of fighter development by the parent firm, and more directly in four progressive steps from each firm's first jet design.

The Hunter is a little faster, flat-out; the Swift has more range. The Swift will probably be in squadron service sooner; the Hunter may be a little easier to maintain in the field.

So it's interesting to see how two production approaches from opposite directions can turn out such similar end products.

Supermarine Swift

Production of the Supermarine Swift will center around the factory at South Marston, near Swindon. Just one year ago that plant was up to its trusswork in production of the Attacker for the Royal Navy and Pakistan (AVIATION WEEK Oct. 29, 1951, p. 21).

Today there are early production Swifts on the lines and—in lesser number—in the air.

It's a far cry from the straight-winged Attacker to the highly swept Swift. The two craft are comparable in size, but there the resemblance ends.

► **Swift's Avon**—The Swift is powered by a Rolls-Royce Avon turbojet with an afterburner. This powerplant dictates the major portion of the fuselage design, beginning with the elephant-ear inlets forward of the pilot's station and running aft about 30 feet to the rapid taper of the tailcone around the jet exhaust. Underneath the heavy ducting snuggle a pair of 30-mm. cannon—later planes will carry the full complement of four.

Wing platform of the Swift is unique; basically a swept structure, the inboard leading edge has been cranked forward an almost-imperceptible amount. The outboard trailing edge has been cranked aft at a greater angle of sweep than the inboard portion. Ailerons are huge and of large chord.

Span of the craft is 32 ft. 4 in.; length is 41 ft. 6 in.; height is 12 ft. 6 in. The wing area has been reported as 295 sq. ft.

► **Production Status**—Supermarine is in the early stages of production on the Swift. At the time of last year's visit, the factory didn't even have a letter of intent to build the airplane; in less than one year, they have built up a respectable production line.

A walk through the shop shows more machines than last year. Some of these have been delivered from the U. S. "... at long last," said one official—to fill the floor space reserved for them since last year. Others have been purchased in England and from all over the Continent.



HAWKER HUNTER, in the same class, but typifying the traditional British emphasis on individual craftsmanship.

The overall impression is that Supermarine has some of its required tooling, but not enough. Take the Cincinnati Hydrotels—Supermarine has one, but needs six to meet schedules. Officials don't let anybody forget the need for those extra five, either. Callers from the Ministry of Supply who go to the office of S. P. Woodley, South Marston's superintendent, are generally greeted with, "Have you got my Hydrotels yet?"

One large spar miller is installed, but no skin mills. That latter work is being done on a small scale on converted machines; Supermarine is putting together a large-size skin miller from odds and ends.

► **Something Different**—Your first definition impression that the Swift is going to be built differently comes when you see a stack of tissue-wrapped parts. You're told that this is part of an educational program—and possibly a future standard procedure—to acquaint production workers with the need for careful handling of the high-strength, notch-sensitive materials.

Surface scratches are definitely out; any such damaged part has to be scrapped. Hence the wrapping procedure, and the use of felt-covered storage racks and the addition of a large group concerned with processes and quality control.

Direct comparison of the alloys used was not possible at the time because of the differences in British and American nomenclature. The ultimate tensile strength of the alloy making up most of the Swift is 64,000 psi. This would compare to the strength of Reynolds alloy R301, or Alcoa 75 ST.

Standard finish of machined parts is pegged at 20 micro-inches for the high-strength alloys. Supermarine is conducting a series of development tests aimed at establishing a quick and thorough procedure for a 10 micro-inch surface finish on machine parts. One such technique uses tumbling, with the abrasive medium a mixture of granite chips, soap and water. The parts thus treated have the necessary finish, and show a slightly "weathered" appearance under factory lighting.

► **Light Strength**—Weight control is everywhere in evidence at Supermarine. A typical example would be found in a fitting which used a row of bolts for attachment. Instead of a straight-line finish on the bolting flange, the designers have specified a scalloped edge to remove the excess non-working material between boltholes. This kind of philosophy has been carried through on the Swift wherever spare material wasn't carrying any load.

Tool engineers at Supermarine have developed a basic system of checking flat parts such as ribs. Their gadget uses a surface plate in combination with locating pins, holes and blocks laid out on a modular grid. When the part is fabricated, two of these locating points can be built into the piece. Checking of the finished contour is quick and simple, with a "go-no-go" answer available instantly to an inexperienced inspector.

Size of the fixture is such that most medium-sized parts can be checked. Adaptability of the scheme means that groups of parts can be inspected on a daily basis, for example with the inspector running through a cycle of ribs

and then changing the fixture to check splice plates and so on.

► **Summing Up**—All internal details of the Swift are classified, which makes it impossible to illustrate individual parts and describe their fabrication. It is possible to make some very general statements based on the external appearance of the Swift, tempered with background knowledge of the firm.

One British technician pointed out that while the Swift in not as pleasing aesthetically as the Hunter, it has a more brutal look, a tougher appearance. "It's a fightin' machine," he said, "and it's built that way."

A look at photographs of the Swift gives clues to the internal structure. From cockpit to tail there is a large removable panel on the upper surface of the fuselage for engine access. Only five frames carry loads through this area, judging by photos. Even with load-carrying panels, these frames must be heavy construction.

Use of the panels also dictates the use of a pair of heavy longerons serving as attachment rails for the lateral edges of the panels.

The second and third frames aft of the cockpit are attachment points for the wing spars and together form the structural guts of the Swift. Wing appears to be very thin with few chordwise members in the inboard sections. The use of heavy wing skin follows from these structural considerations.

Hawker Hunter

Hawker will produce the Hunter at two major sites—the Kingston plant currently finishing Sea Hawk production,

and the new Blackpool plant currently making trial components on the piston-engined Sea Fury prior to swinging into Hunters.

Right now the problems of tooling and jiggling are keeping the Hawker staff busy. The second prototype Hunter was flown not too long before the Farnborough display. There are no production aircraft completed, and there are none in final assembly.

The Hunter is the latest in a line of Hawker jet aircraft that began at war's end with the P.1040 (modified somewhat in later years to become the current production Sea Hawk). Successive development of that little aircraft led

to the Hawker P.1067, first demonstrated publicly at the Farnborough display in 1951. Later the P.1067 was named the Hunter and given the super-priority go-ahead.

A Rolls-Royce Avon powers the Hunter. There is no afterburner installed, although indication is that there will be.

Fuselage lines of the Hunter are easily the most beautiful among contemporary fighters. Its wing has low aspect ratio (square of span divided by chord) and normal sweep.

Four gun ports, for the 30-mm. cannon, scar the fuselage belly of the second prototype Hunter.

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INDUSTRIAL PRODUCTS DIVISION



Span of the Hunter is 33 ft. 8 in., length is 45 ft. 3 in.

► **No Production Yet**—The Hunter has a conventional structure of the usual aluminum alloy; there are no tapered or milled skins used, and no extremely fancy machined parts. Jigging and tooling is comparable to American practice except for the degree of mechanization and the materials used. Reason for the deviations is the number of planes ordered.

Hawker's plants, like so many other British aircraft factories, are spread all over. Experimental machine shops are in one location; a component shop is a few blocks away. Parts are trucked from there to a third plant for assembly and flight test. So you can't get the whole picture by walking through a single building.

But the component shop is probably typical. It is, by American standards, under-mechanized. Three Farnham 16-ft. rolls, one rubber press, a couple of stretch-presses, and one Onsrud A-80-A spar miller make up the large-machinery inventory.

The emphasis is on minimized storage of raw materials and finished components. The whole production scheme is set up around the idea of keeping the lines flexible, mobile and moving.

► **Floating Rafts**—Kingston, the site of several Hawker plants, is on the Thames River. The subsoil is unstable; conventional jigs and fixtures would be out true in a week.

So Hawker uses steel rafts—a heavy, rigid foundation made of steel sections and plate—to carry fixtures as a superstructure.

Some of these rafts were being located on the factory floor during my visit, and others—of sizes suitable for wings or fuselage sections—were being built.

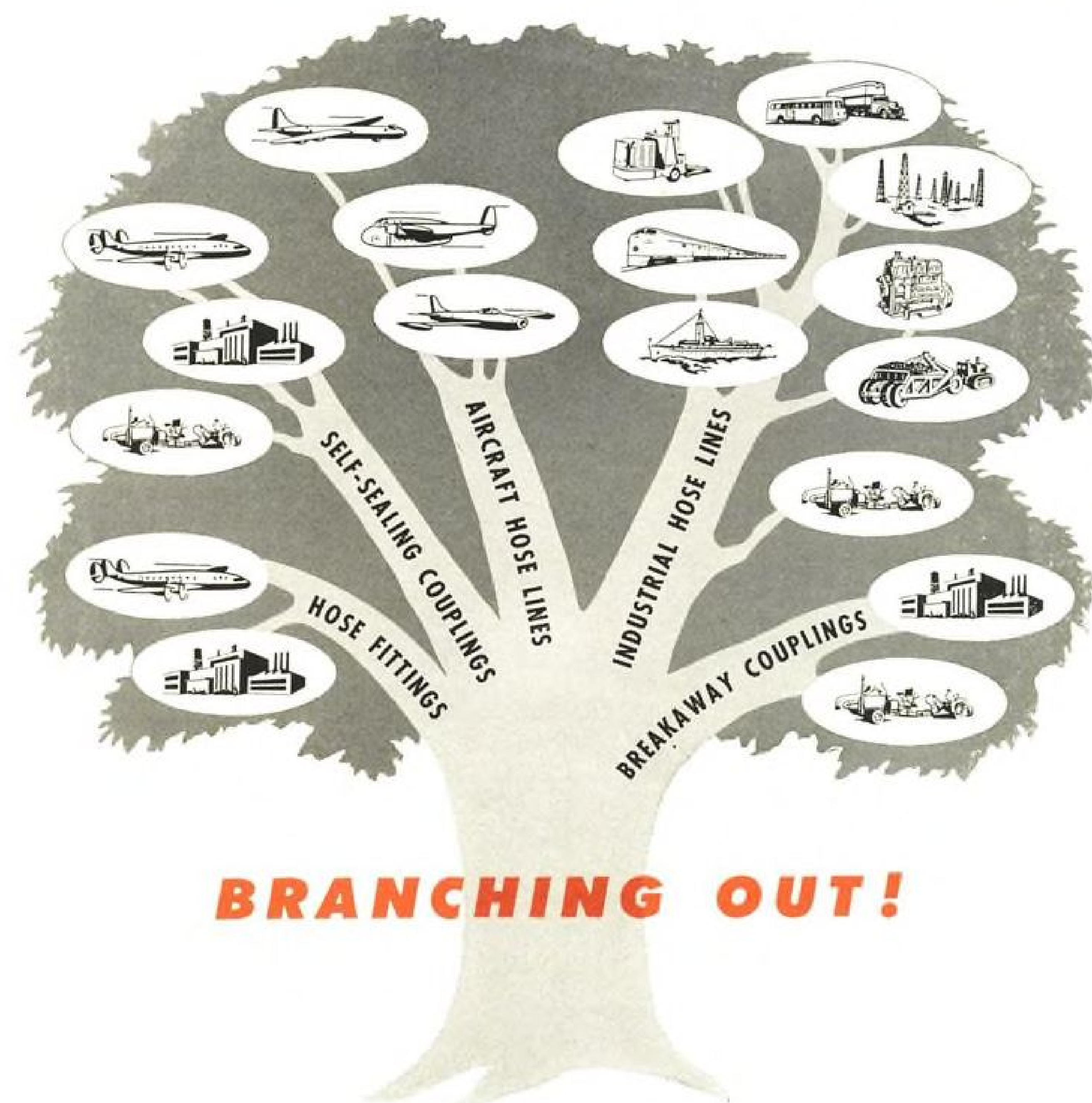
These rafts pay a dividend in mobility of the line. The entire fixture can be lifted out of the floor and moved on a truck to another site to start production there. It is also possible to set these fixtures up in odd corners of a partially filled shop, and produce parts from them while waiting for the day the shop is empty and a proper line can be organized.

► **Router Grids**—Router work starts a lot of Hunter parts on their way through the shops. Instead of making individual plywood beds for each part, complete with locating blocks, Hawker uses a basic open metal grid which locates template and stock quickly and easily. That way only a few of these grids are needed—for setup and working—and minimum storage space is required for the flat templates.

Plywood bases and wooden superstructures are used in tube-bending. Every bit of tubing that goes into the airplane is formed at the bench on a

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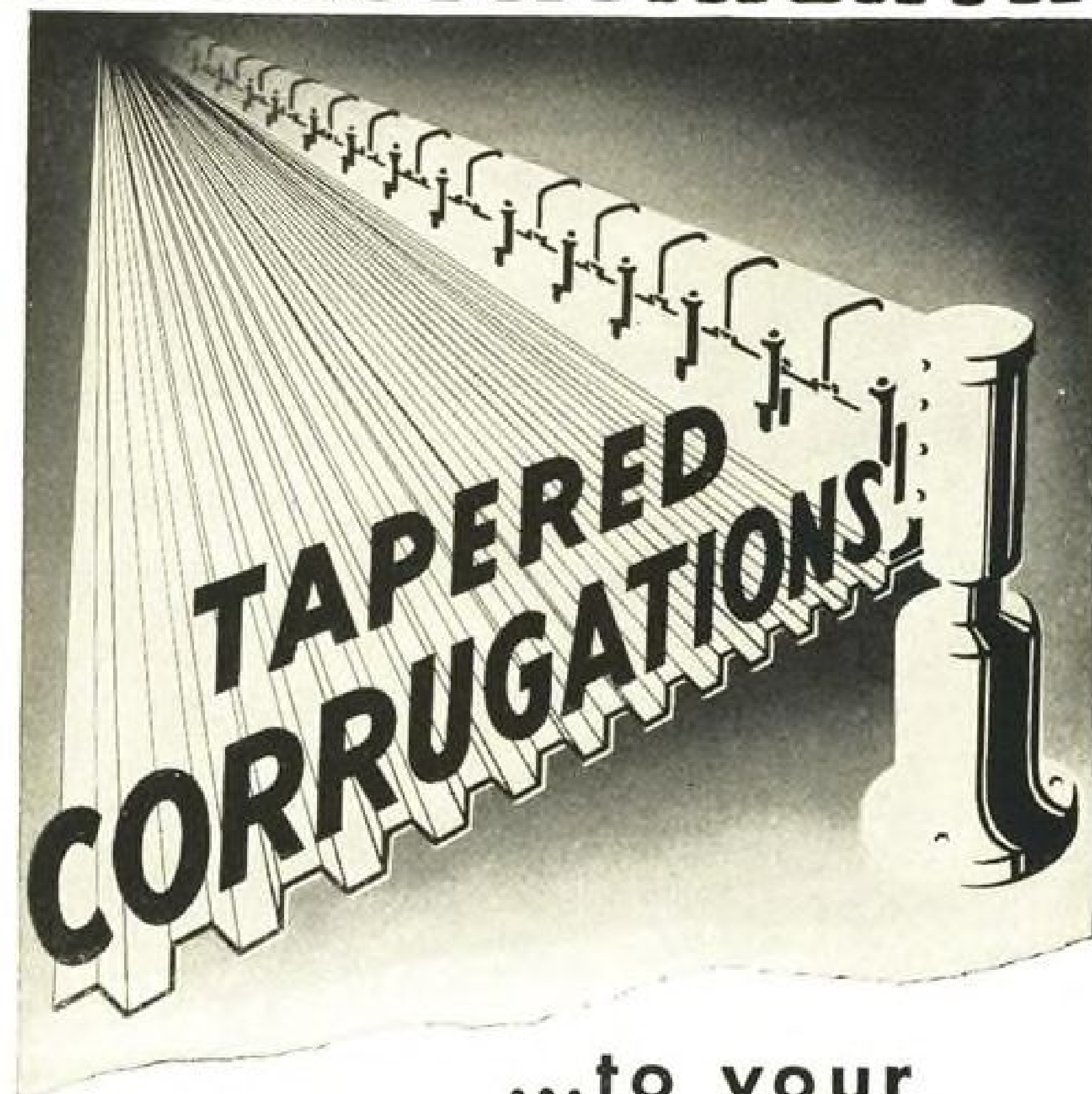
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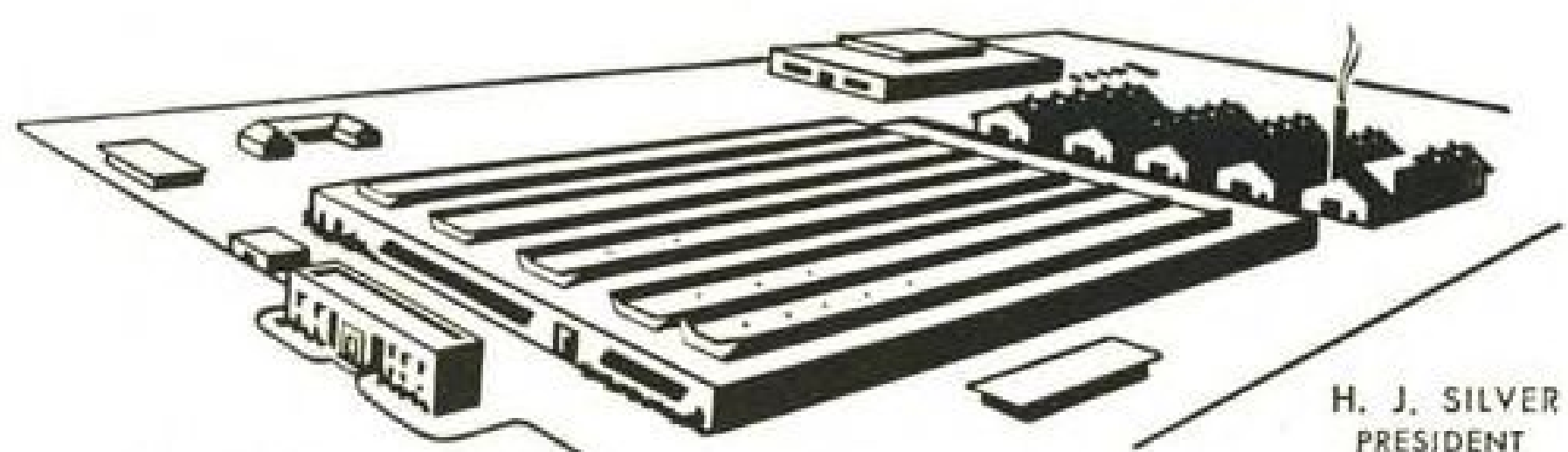
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fixture. Low-melting-point alloys are used as tube fillers.

Jabroc—which resembles American Masonite—and Hy-du-lignum, a laminated compressed wood, are both used for forms in press work at Hawker. Here again the quantity of parts being made permits the use of these materials instead of steel, for example.

Hawker is using reinforced concrete for stretch-press dies. The form is built up to rough contour with the concrete, and then finished with about one inch of clear cement. A layer of clear plastic is sprayed on to fill pores and provide the necessary smooth surface.

► **Summing Up**—The Hunter, like the Swift, is covered by military security, and as with the Swift, it is not possible to describe detail parts.

But the Hunter is different from the Swift in basic structural design. It will be built along the same general lines that Hawker has built all of its metal airplanes, with multicell construction. Examination of pictures of the plane's exterior indicates the use of a number of fuselage frames plus the usual stringers and skin. Pictures also indicate that the fuselage tail-section comes off for access to the jet engine.

If you had to make an overall comparison of the Hunter and the Swift as structures, you'd probably say that the Hunter was mostly monocoque and the Swift was mostly built-up. On load factor, stiffness or performance there is little to choose from.

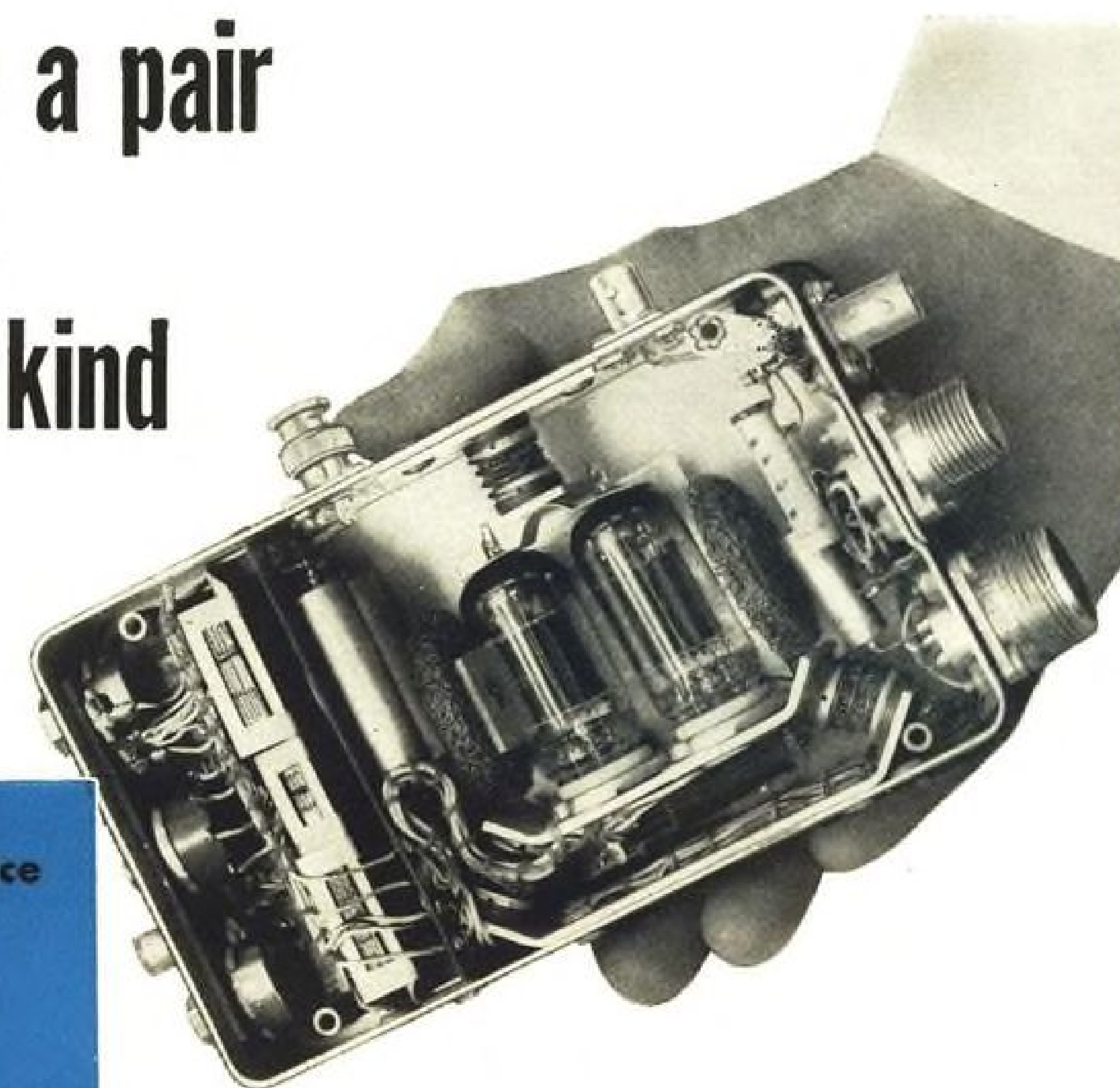
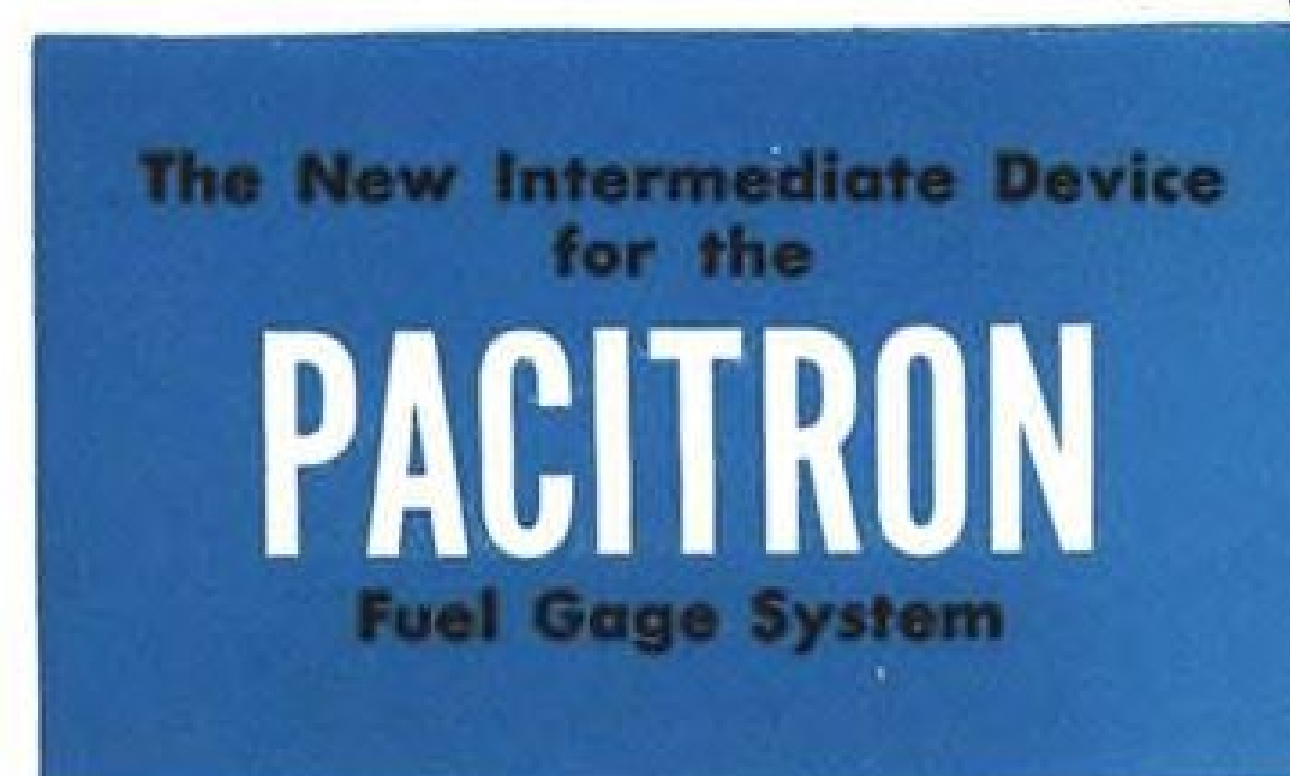
There are lots of "ifs" to the production programs for Swift and Hunter. But for airframes, my own estimate is that Supermarine, with its head start and mechanization, will be able to out-produce the Hawker plants on units per month. This assumes continued availability of machines, an assumption which is the foundation stone of the Swift program. Supermarine has been somewhat more daring in its structural approach and production planning. With the nerve to take a greater risk, they also stand to get the greater returns that go with having Swifts in service before Hunters. That is the way it will probably be.

Small Firms Unite To Seek Defense Work

A production pooling arrangement for small-firm participation in defense contracts has been announced by General Tire & Rubber Co., Akron, its sponsor. A new organization—General Tire Production Pool, Inc. has been organized to direct activities, and the program has been approved by the Attorney General, Federal Trade Commission and Small Defense Plants Administration.

Under this type of holding company, General reports it will solicit defense

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contracts, assume liability for filling orders, and provide sales, design and development engineering services. Accounting and legal assistance also will be offered. General won't do any of the manufacturing—production facilities will be provided by small industries in the surrounding areas. This puts General in the role of a manufacturer subcontracting work to other firms.

The pool primarily was formed to get defense orders for aerial cameras, aircraft instruments and electromechanical devices.

Pool team is expected to be made up of about 25 members. In addition to General, charter members are these Ohio companies: McCaskey Register Co., Alliance; Ectro, Inc., Delaware; Sterling Mfg. Co., Cleveland; and Electronic & Mfg. Co., Akron.

For membership eligibility a company must have less than 500 employees and be equipped to do high-precision manufacturing. As sponsor, General is exempt from the small companies limitation imposed by SDPA. No other tire manufacturer will be eligible for membership.

The production pool company will be a non-profit organization. There will be no dividends, members benefiting from the work each performs. For sales and management services General will get a fee.

Pool members will be able to solicit other business on their own.

PRODUCTION BRIEFING

► **Allied Products Corp.**, Detroit, maker of hardened and precision ground parts including punches and dies, has placed its new Hillsdale, Mich., plant in operation. The new facility makes piston and jet engine parts.

► **Aviation Power Supply, Inc.**, Burbank, has overhauled and prepared for export a number of Wright R2600 engines for the Babb Co. The firm is doing major overhaul on P&W R2800s for The Flying Tiger Line.

► **American Machine & Foundry Co.**, has given its Boston subsidiary, Transducer Corp., divisional status. The latter makes electronic and ultrasonic trainers for USAF.

► **Borg-Warner Corp.**, Chicago, has formally acquired E. C. Atkins & Co., Indianapolis saw-manufacturer, and has designated the firm its Atkins Saw division.

► **Canadian General Electric Co.** has opened a \$2-million overhaul plant at Downsview, Toronto, to handle work

on GE J47 jet engines powering Canadian-built F-86 Sabres.

► **Cee Bee Chemical Co.**, Los Angeles, has broken ground for a new plant covering more than 15,000 sq. ft. in Downey, Calif., and scheduled for completion late this year. Cee Bee will house all West Coast manufacturing in the new location except its research and development laboratory.

► **Joel Fox Co., Inc.**, Los Angeles, has appointed Alignment Instrument Associates, Hollywood, as its representative in 11 western states for the Align-A-Scope, used in optical tooling.

► **General Controls Co.**, Glendale, Calif., has opened a plant at Skokie, Ill., having 60,000 sq. ft. of floor space.

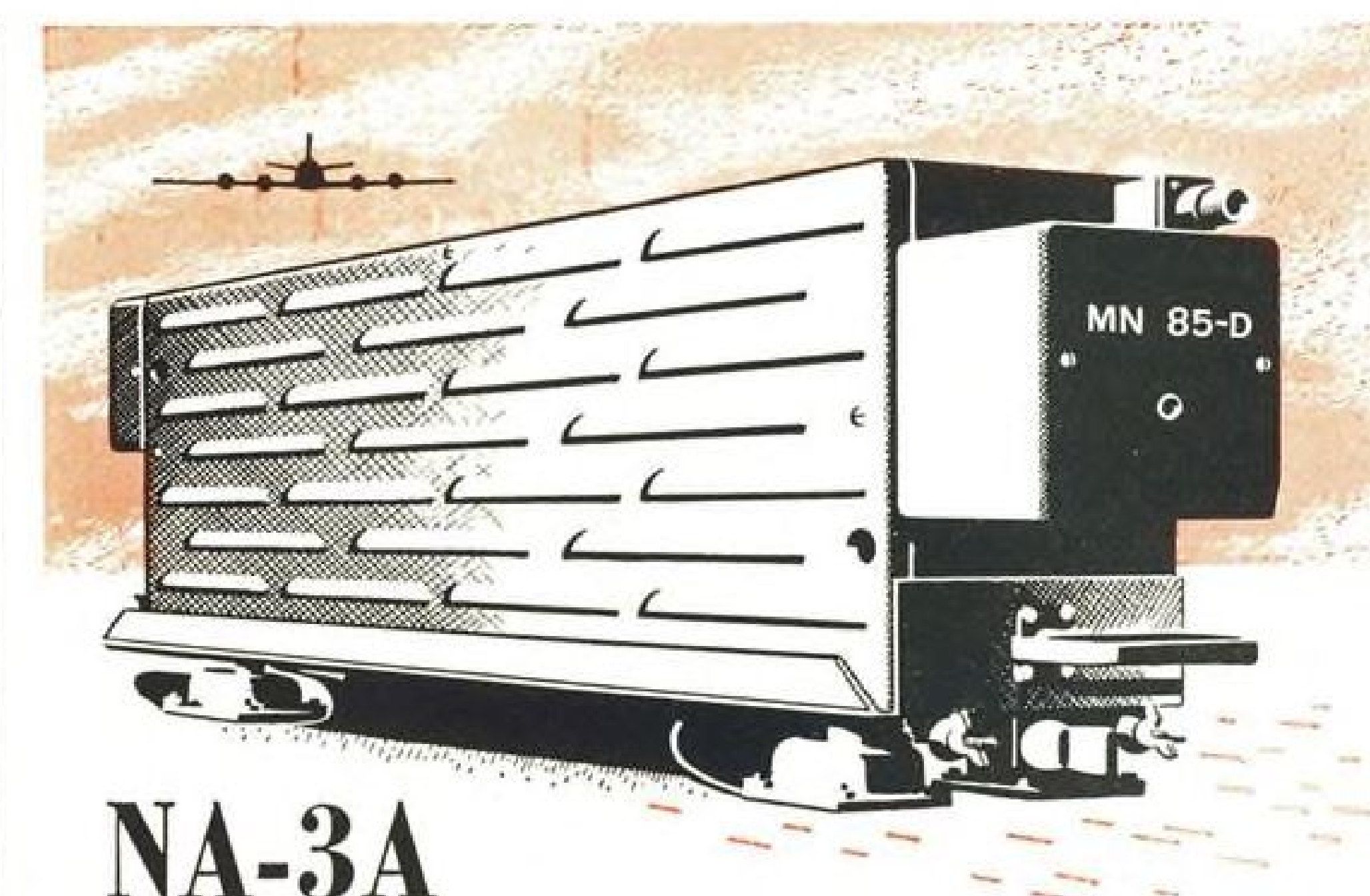
► **Hart Metal Products Corp.**, Elkhart, Ind., has been purchased by Thur Schmidt, Chicago. Name of the acquired firm formerly was Hart Pressed Steel Corp. The company makes aircraft and automotive parts.

► **Kaman Aircraft Corp.**, Windsor Locks, Conn., has moved its research department from Bradley Field to Simsbury Airport, Conn.



DRILLING PAYOFF

This production trick is speeding guided missile output at Douglas Aircraft Co., Inc.'s Santa Monica plant. Jig structure was fitted with 19 Keller Airfeeddrills to put 19 holes in missile fin's leading edge, then seven in trailing edge after the part is turned over. Entire operation takes 36 sec. as against 4.2 min. for previous procedure. Machine downtime is cut through use of spare motors and valves, which can be changed in less than 5 min. Setup was designed by R. M. Challenor in Douglas' Santa Monica tooling division.



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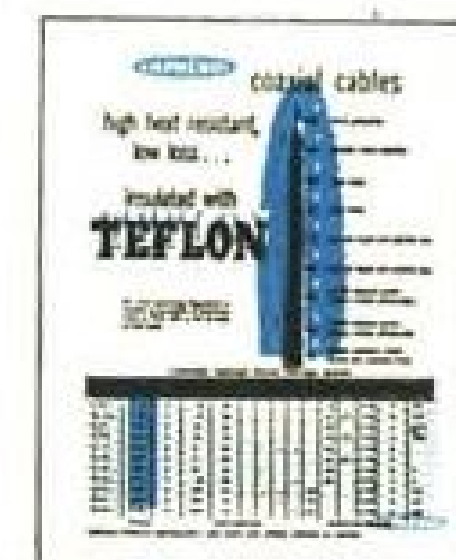
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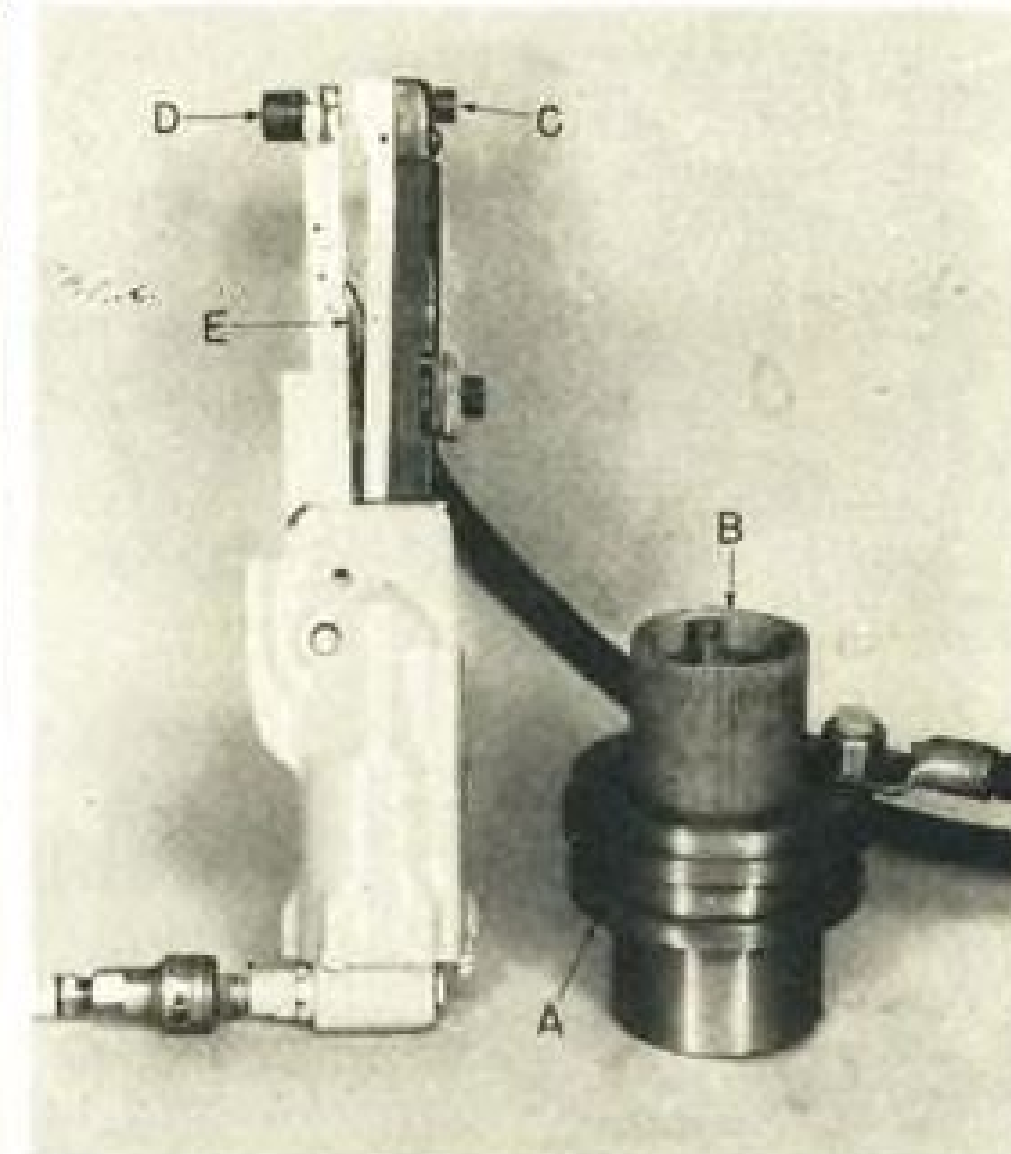
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SPOTWELDING TOOL for telescoped tubes: A, current-carrying copper ring, also serves as fixture; B, tubes to be welded; C and D, insulation tip and electrode, respectively, for insertion in tube; E, pneumatically operated wedge to force tip and electrode into contact with tube, completing circuit with copper ring.

Telescoping Tubes Spotwelded Faster

A new spotwelding tool developed at Rohr Aircraft Corp. simplifies the joining of telescoped tubes. With Rohr's new approach, there's no interference from the holding fixture, a frequent problem in the past.

In spotwelding the ends of telescoped tubes, Rohr previously used a holding fixture and portable welder—one electrode against the outer tube, another against the inner tube. As the welding tool was turned for the various spots, the outer electrode often was obstructed by a part of the fixture, preventing the weld from being made at that point.

Rohr got around this difficulty by positioning the tube ends in a heavy copper ring that surrounds the outer tube and serves as a fixture. Two pivoted arms of a special portable welder are inserted in the inner tube, one arm carrying an insulating tip, the other a copper welding electrode. The heavy copper ring and the welding electrode are connected to the cable ends supplying the current.

For operation, a wedge between the two arms is pneumatically actuated to force them apart, so that the insulating tip and the companion electrode are pushed into contact with the inner tube walls. When this happens, current passes through the two tubes between the electrode and the copper holding fixture, to effect the weld. Release of air pressure withdraws the wedge, closing the arms and breaking contact.

To weld the tubes at another spot,

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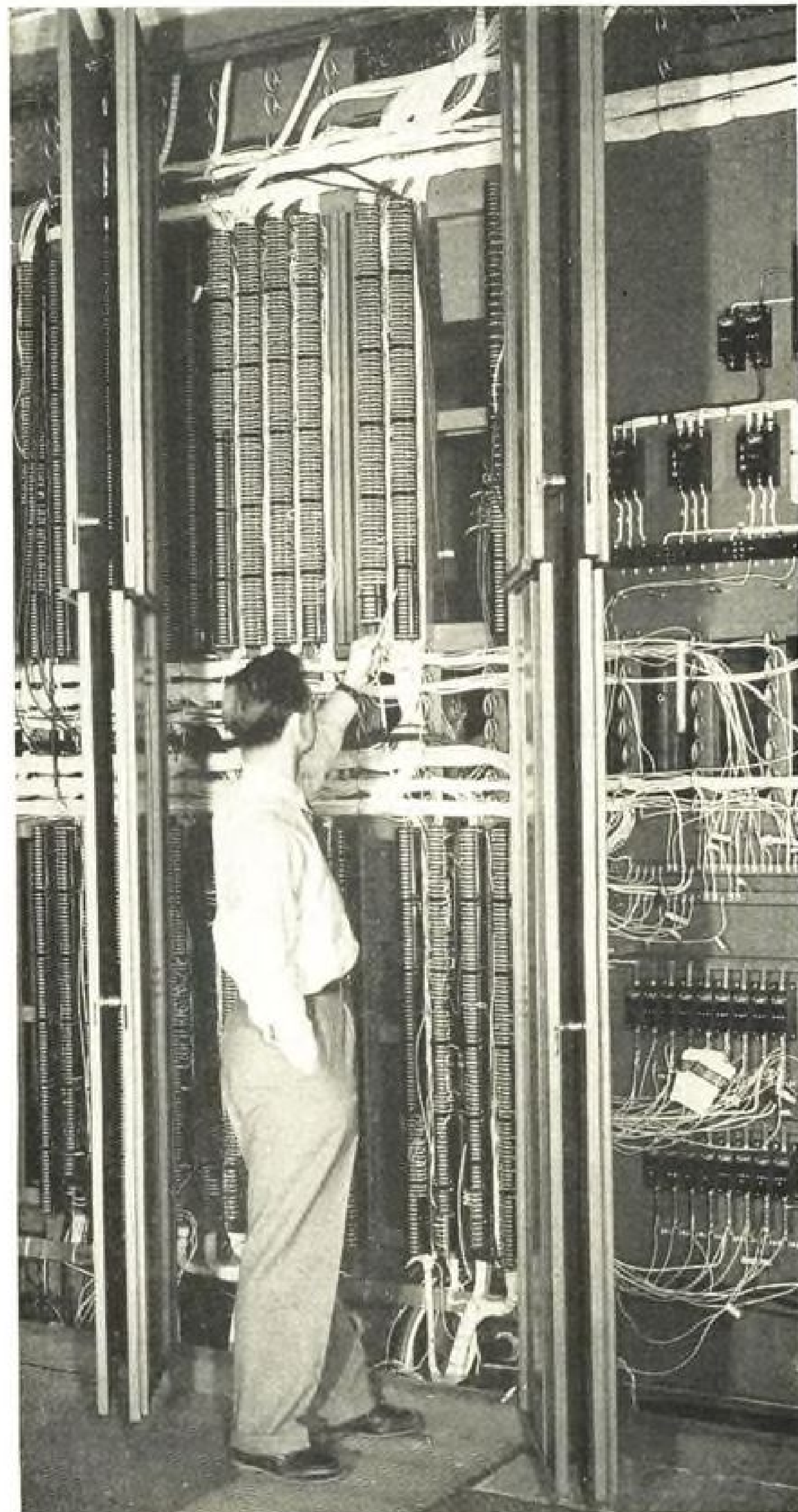
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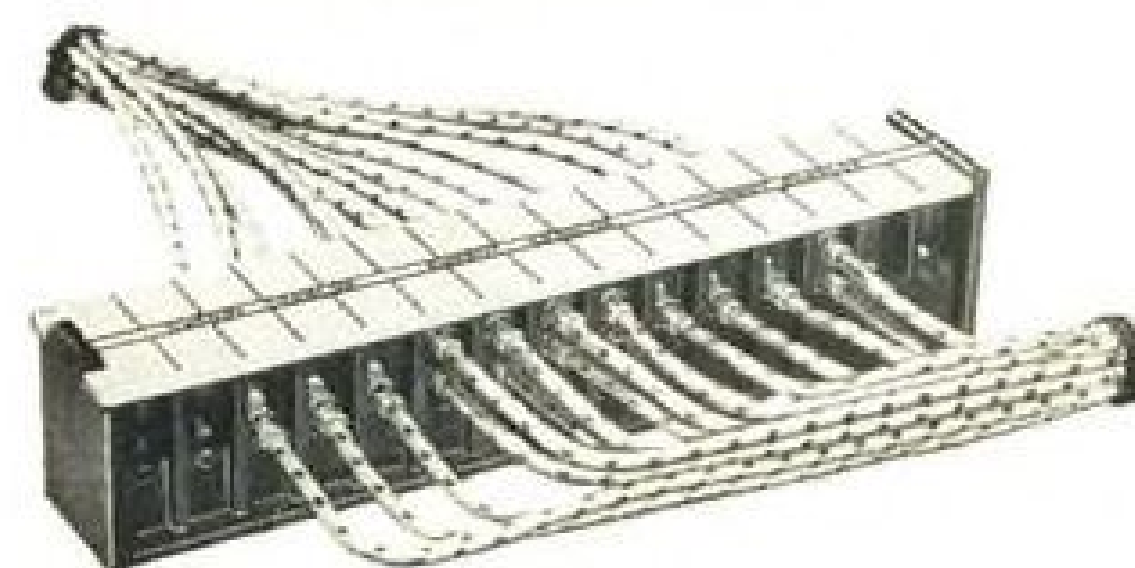


Bank of Control Terminals of Brookhaven Cosmotron, with compact, trouble-free wiring made possible by use of three different types of Burndy connectors.

52-21

Burndy connectors are integral units of the Cosmotron electrical control panels . . . because Burndy combines *maximum electrical efficiency* with *mechanical strength* that withstands the most severe stress and vibration. What's more, in the over 100 miles of wiring, hundreds of thousands of electrical connections were made largely by *electricians without special training*—because Burndy connectors rely on *engineered design* to insure stable, secure connections.

Naturally, Burndy is very proud to be part of the Brookhaven Cosmotron—and equally proud of our myriad everyday jobs in utilities, industry, manufacturing, general service.



CRABLOKS—Quick-connect, quick-disconnect terminal blocks, placed end-to-end, provide multiple secure terminal connections in small space.

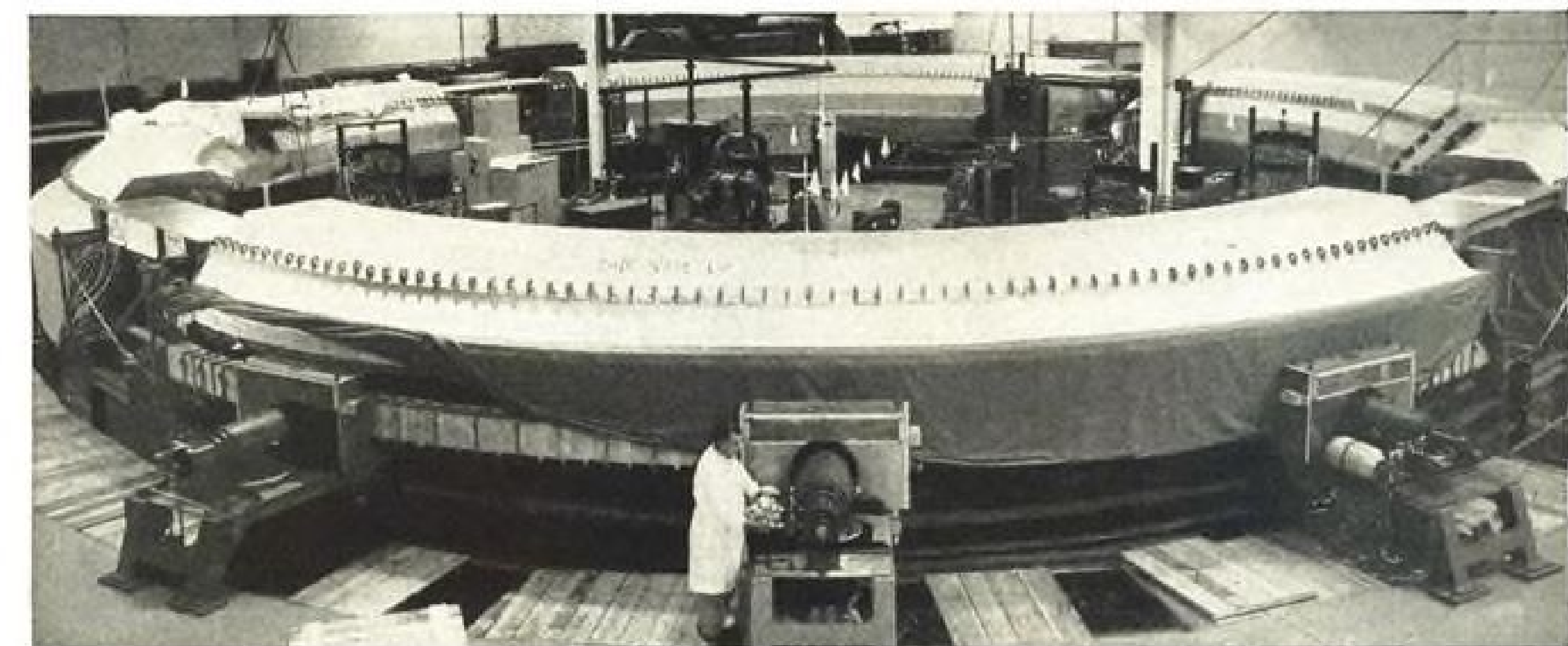


HYLUGS—Indent-type terminals—with matched Burndy tooling—provide secure, uniform, low-resistance connections, easily installed and inspected.

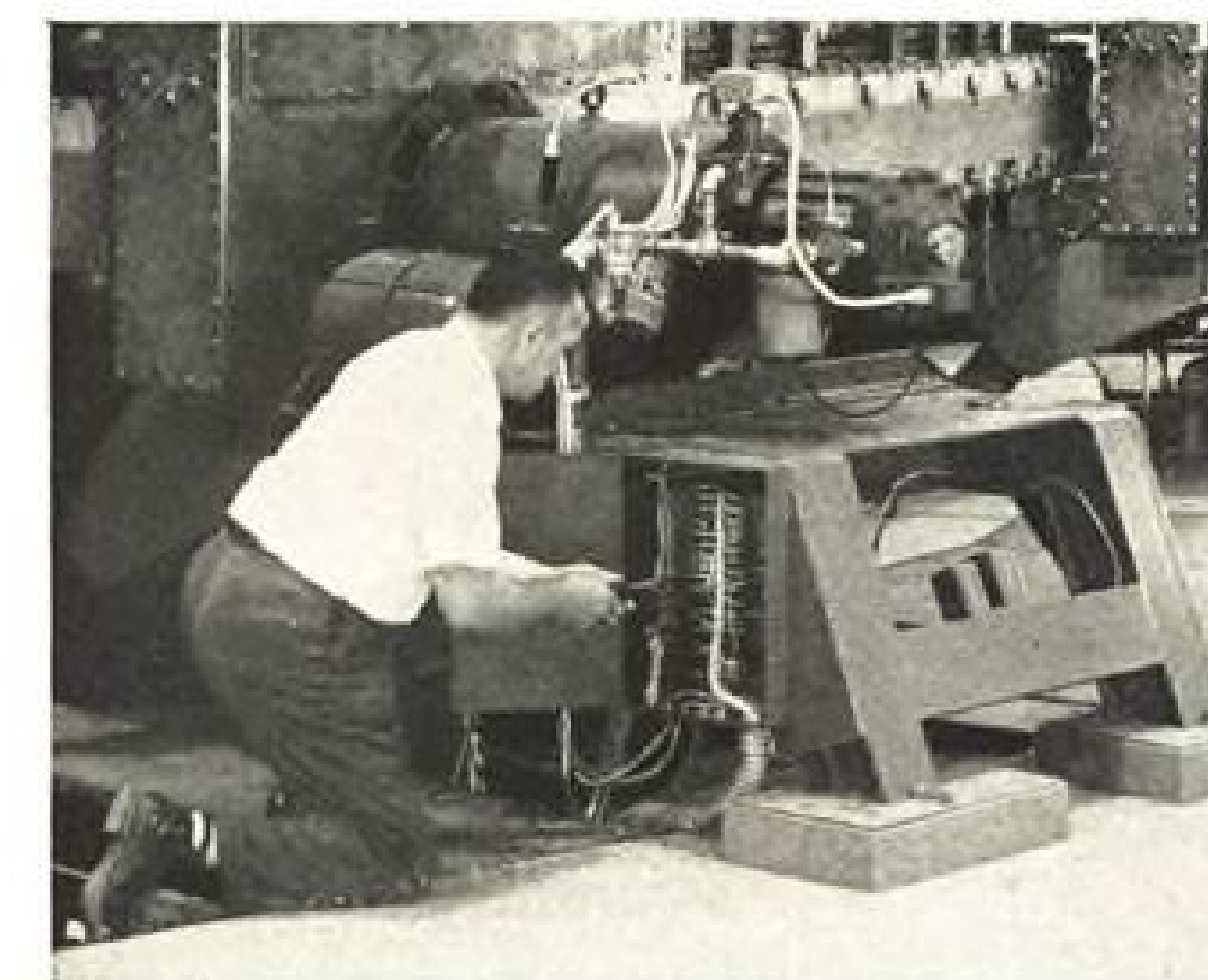
SCRULUGS—Compact connectors for rapid termination of wires and cables. Simple, one-tool installation. Maintain full re-usability.



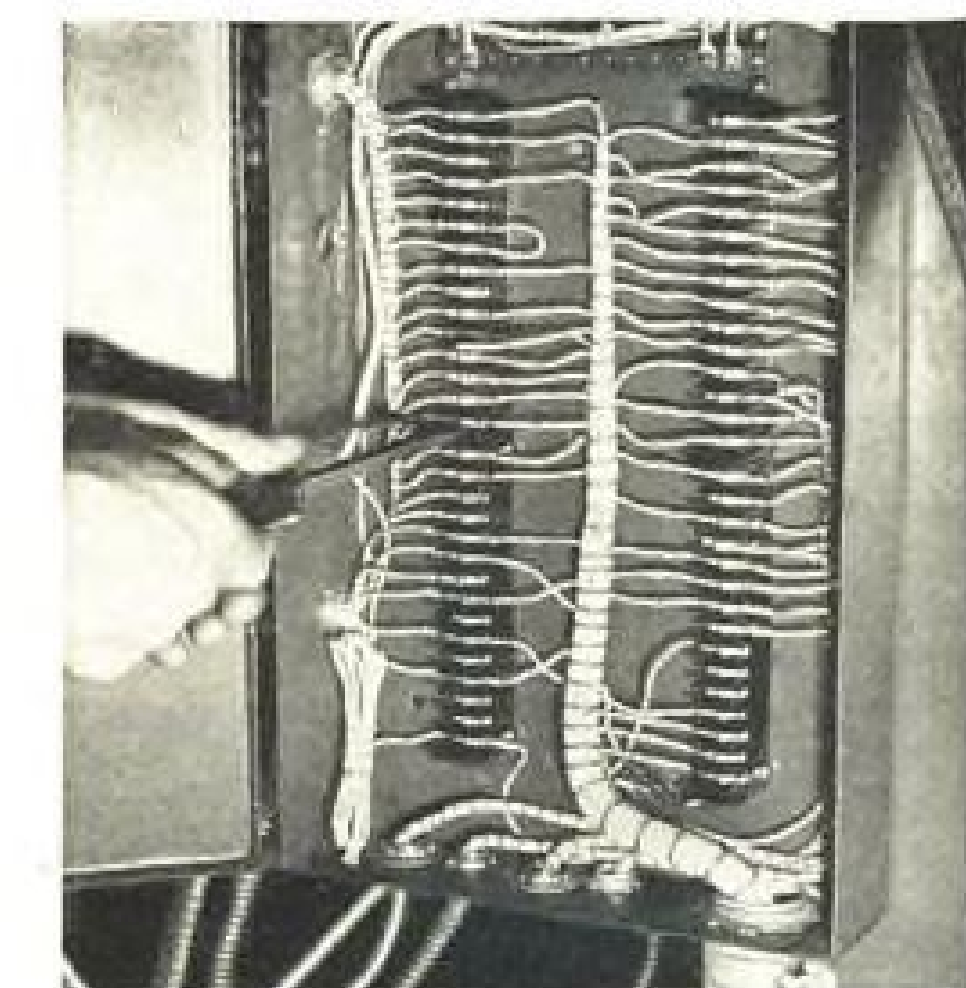
circuits connected by BURNDY



Cosmotron at Brookhaven National Laboratory, Upton, L. I. World's most powerful atomic accelerator utilizes 40 million watts, accelerates nuclear particles to 170,000 miles per second.



View of the Cosmotron, showing diffusion pump, with terminal box in foreground.



Terminal box at left with Burndy Crabloks and Hylugs.

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Partial interior view of Stewart Air Service, Hawthorne, California, DC-3 fully 28 passenger place equipped and CAA approved with TECO light-weight hi-density kit seats as shown above.

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the operator turns them through the proper angle for the new position of the electrode, and actuates the pneumatic feed for the wedge, setting up the welding current.

Rohr has a patent on the device and is manufacturing it for its own use. The company has indicated it will make samples for firms in aircraft or allied industries, but will not engage in commercial production. It will license production for use in individual plants or for the commercial market.

Fast Writeoffs

Accelerated tax amortization for manufacturers expanding their defense facilities is granted by the government in the form of certificates of necessity.

In the following list of recent certificates, company name is given, followed by product or service, cost of construction deemed necessary for defense expansion, and the percentage of the expansion cost allowed for fast write-off. Fast writeoff permits property to be depreciated in five years.

- Bloomfield Machine Co., Bloomfield, Conn., aircraft parts, \$6,920, 70%.
- New Britain Machine Co., New Britain, Conn., aircraft parts, \$268,258, 55%.
- Scott & Williams, Inc., Laconia and Lakeport, N. H., aircraft parts, \$115,595, 65%.
- United Aircraft Corp., E. Hartford, Conn., aircraft engines and parts, \$1 million, 40%; and \$800,000, 40%.
- Republic Aviation Corp., Long Island, N. Y., aircraft parts, \$189,870, 45%.
- Curtiss-Wright Corp., Caldwell, N. J., aircraft parts, \$229,673, 65%; and Buffalo, aircraft components, \$1,750,000, 40%.
- Art Supply & Instrument Co., Inc., New York, aircraft parts, \$11,525, 70%.
- New York Air Brake Co., Watertown, N. Y., aircraft parts, \$159,570, 60%.
- F. & W. Manufacturing Co., Inc., New York, aircraft parts, \$51,354, 45%.
- American Non-Gran Bronze Co., Berwyn, Pa., aircraft parts, \$99,963, 70%.
- Jacobs Aircraft Engine Co., Pottstown, Pa., aircraft parts, \$40,000, 45%.
- St. Joseph Telephone & Telegraph Co., Tyndall Field, Fla., telephone service to defense housing project for Air Force personnel, \$140,000, 75%.
- Moks Machine Co., Detroit, aircraft parts, \$17,130, 70%.
- Allen Industries, Inc., Springfield, Ohio, tools, jigs, and fixtures for military aircraft, \$41,034, 65%.
- Jet Die & Development Co., Inc., Cleveland, aircraft parts, \$21,188, 60%.
- Thurman Machine Co., Columbus, ordinance and aircraft parts, \$43,553, 70%.
- Rado Mfg. Co., Fenton, Mich., aircraft parts, \$11,260, 70%.
- Kalamazoo Stove & Furnace Co., Kalamazoo, aircraft parts, \$51,915, 65%.
- Goodyear Tire & Rubber Co., St. Marys, Ohio, aircraft parts, \$60,175, 65%.
- Lamson & Sessions Co., Kent, Ohio, aircraft parts, \$122,725, 65%; Cleveland, aircraft parts, \$197,531, 65%; and Chicago, aircraft parts, \$158,913, 65%.
- Aeronca Manufacturing Corp., Middletown, Ohio, aircraft parts, \$21,017, 70%.
- Kesley-Hayes Wheel Co., Detroit, aircraft parts, \$160,366, 40%.
- General Motors Corp., Grand Rapids, aircraft parts, \$146,000, 45%.
- Columbus Engineering Co., Columbus, Ohio, aircraft parts, \$75,000, 45%.
- Detroit Harvester Co., Paris, Ky., aircraft parts, \$278,990, 65%.
- Continental Can Co., Inc., Milwaukee, aircraft parts, \$192,412, 65%.
- Trane Co., LaCrosse, Wis., aircraft parts, \$815,638, 45%.

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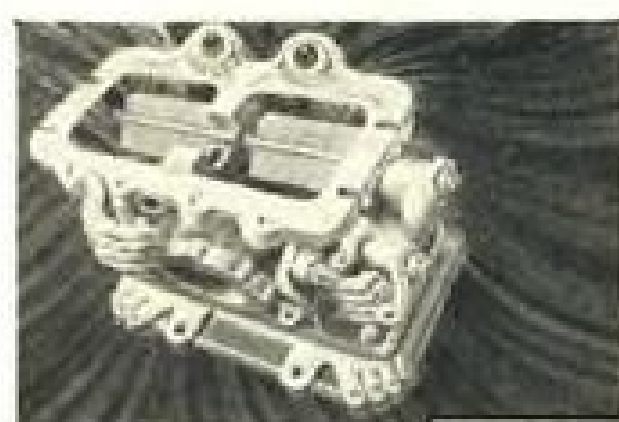
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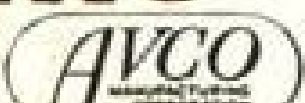
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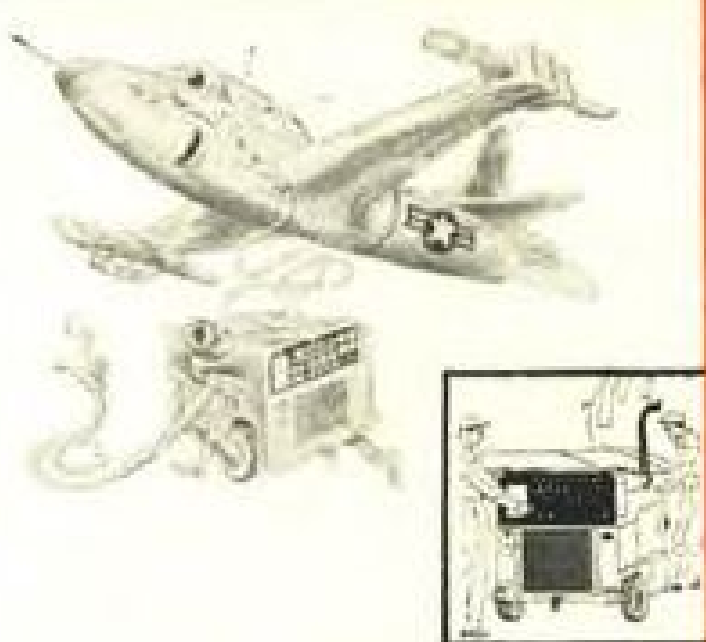


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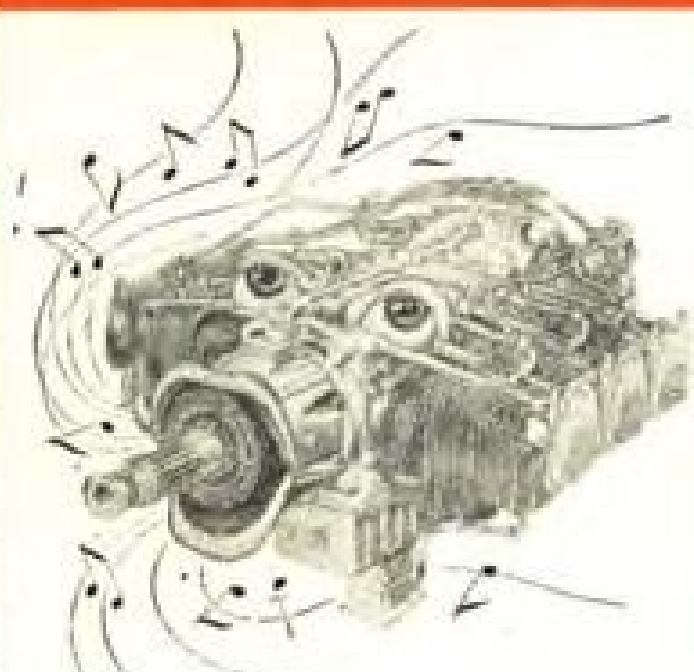
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Illustrations by AITZYBASHEFF



NEPTUNE WINGS and antenna housings set additional strength from Lockfoam plastic. It is also used in F-94s and Super Constables.

Foam Plastic Is Lightweight Stiffener

- Lockheed uses it to simplify structures.
- It also has vibration control applications.

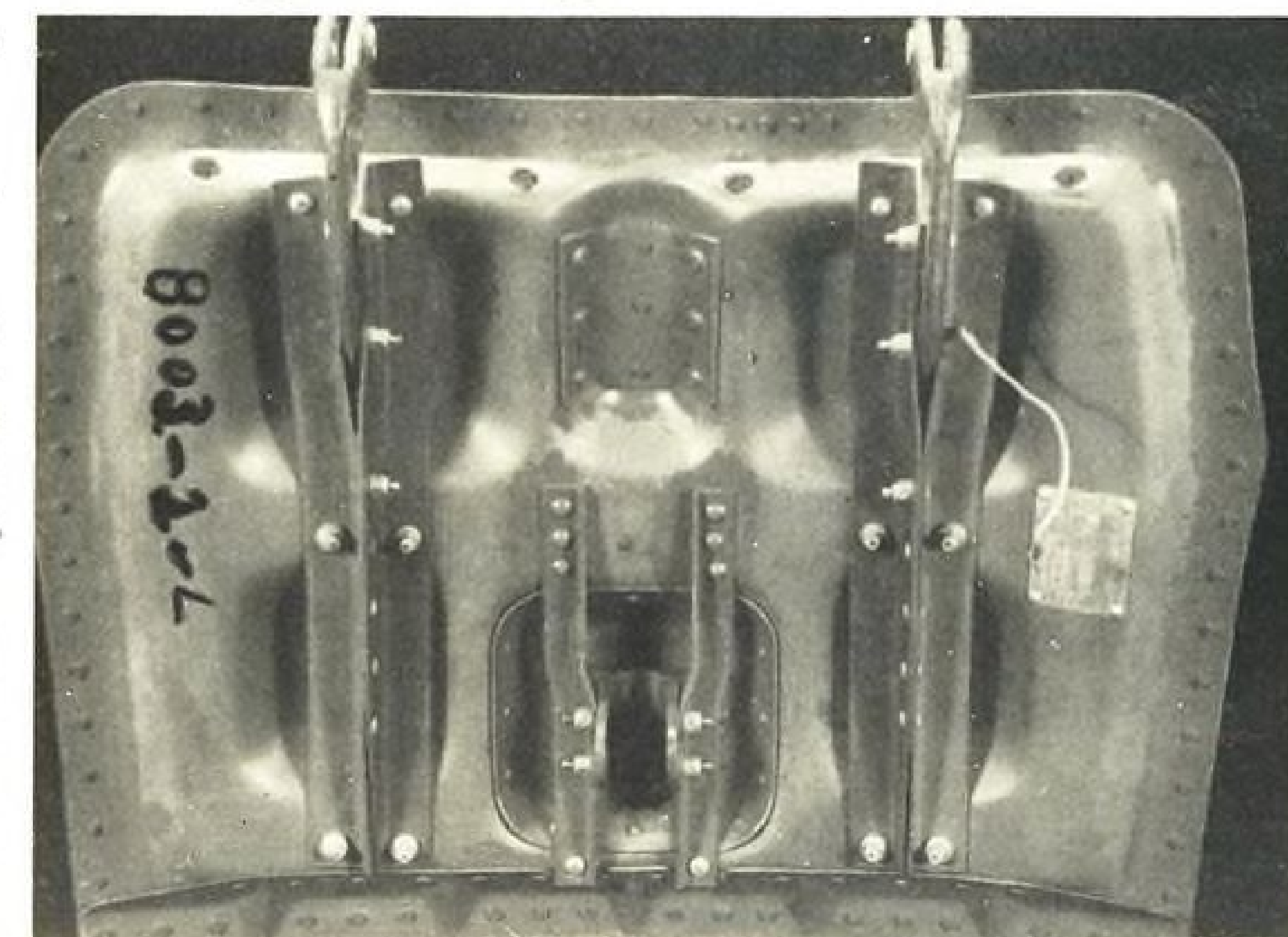
The potential of foamed plastics for filling cavities in aircraft structural components for greater stiffness is getting close attention at Lockheed Aircraft Corp. The company's investigations indicate that there are definite places where it can be used effectively.

Use of foamed plastic is another step toward simplified makeup and the elimination of sundry parts now required for conventional structures. Lockheed looks at it as another tool for the engineer to consider during project design phases, then use judiciously.

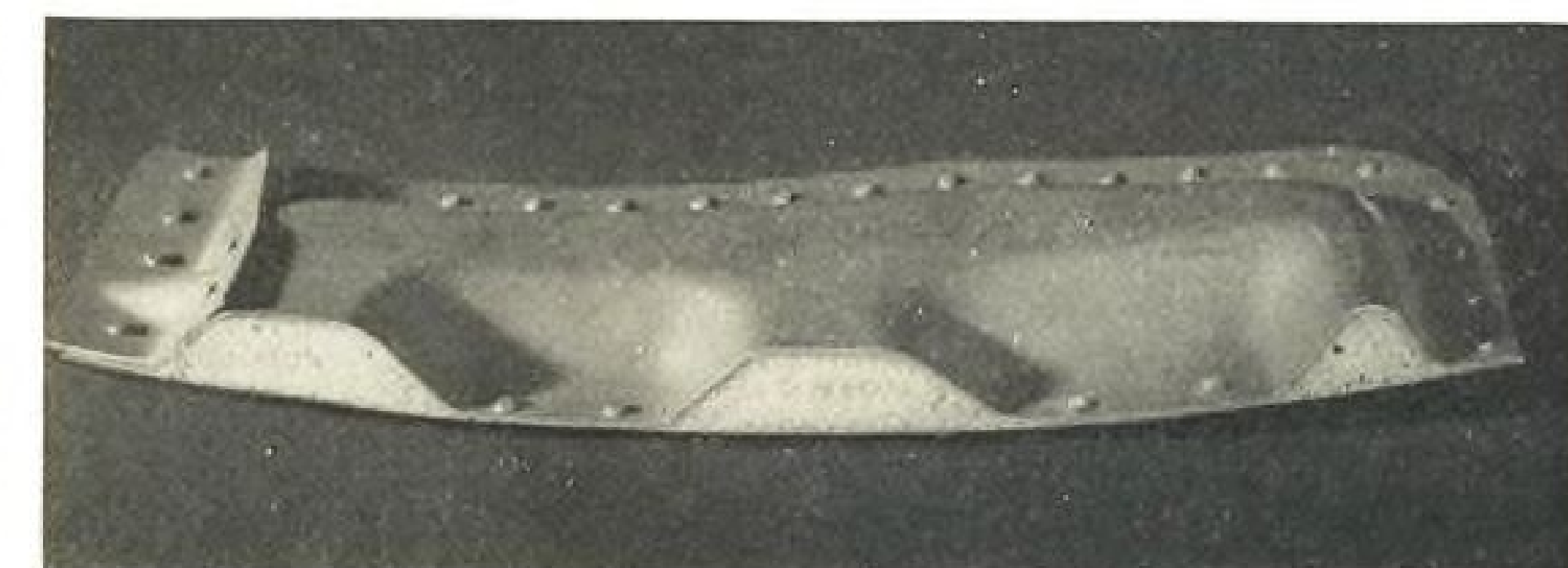
► **In Planes**—The material already has been put to work in Lockheed planes—military and commercial. It is used for filling cavities in F-94 Starfire ailerons, rudders, elevators and wing trim tabs; in the F-94C's nose radome, as a core sandwiched between Fiberglas skins; for additional strengthening of shock-absorbing structures in P2V Neptune wings; in P2V antenna housings; insulation in the Super Constellation's cabin ventilating system; and in rocket doors, for stiffening.

It has potential uses as insulation for aircraft electrical equipment, vibration deadener in cabin doors and fuselage sections, and for soundproofing applications.

The foamed plastic—known as Lock-



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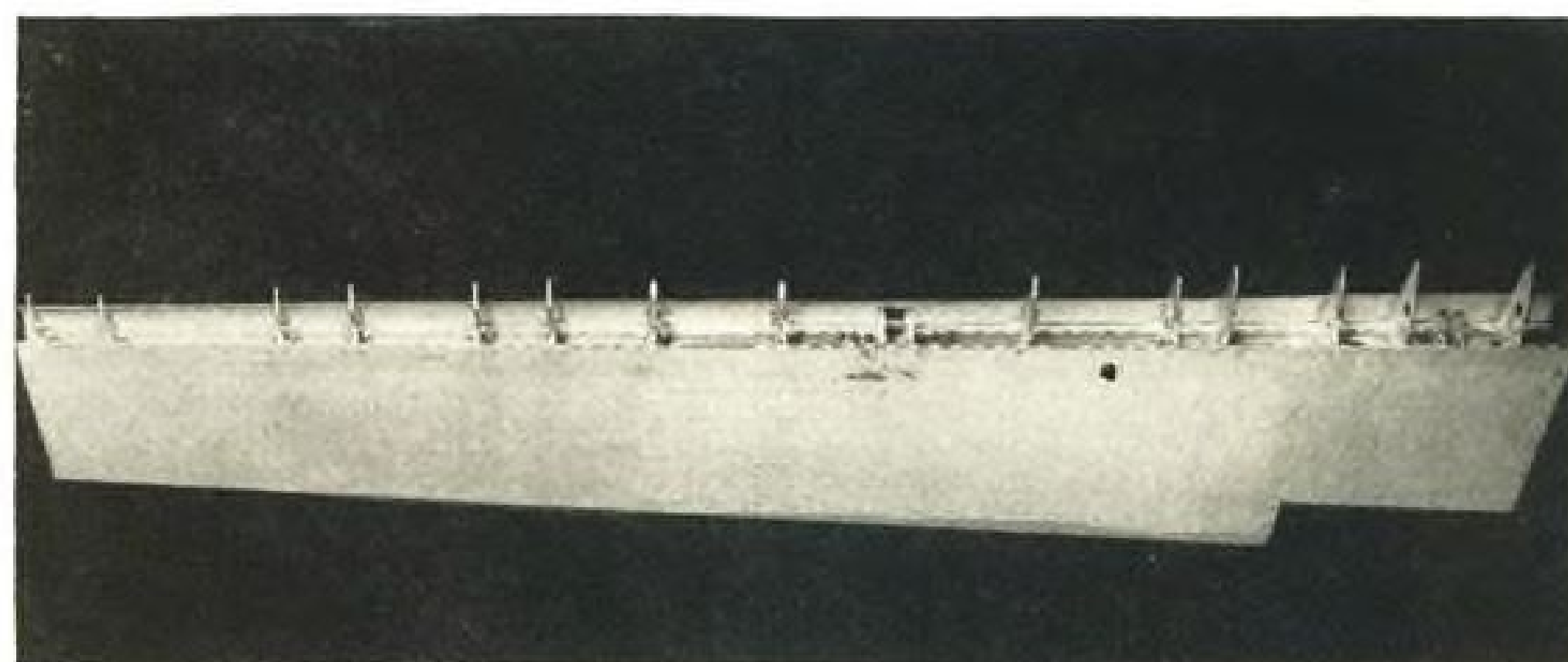
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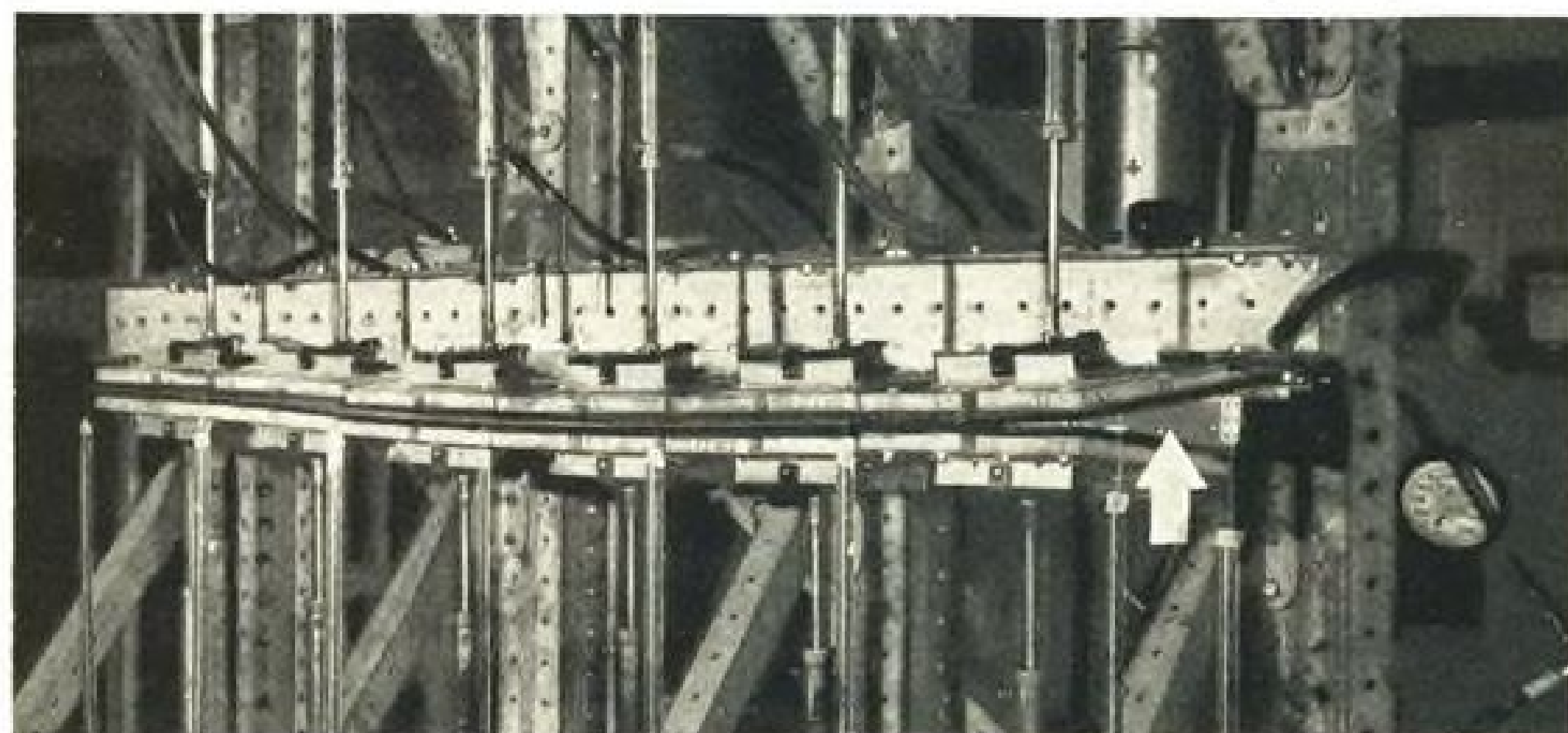
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COMPLETE FOAMED AILERON of Lockheed F-94C all-weather fighter goes on . . .



TEST RIG where 110% design load is applied. Arrow shows plastic-filled cavity.

foam—is a thermosetting, cellular gas-expanded material obtained by chemical reaction of isocyanates and resinous polymers. During the reaction, carbon dioxide is formed and retained as multiple cells in the compound. These cells are substantially not interconnected, giving the material good insulation properties.

One of the plastic's application advantages is that it comes in liquid form and can fill any cavity regardless of its configuration. And the density of the material can be adjusted to meet design requirements. Bonding of the material is automatic.

A similar development, Styrofoam, has been in use at Northrop Aircraft, Inc., for strengthening control surfaces and eliminating vibration (AVIATION WEEK May 5, p. 24). Styrofoam is a hard plastic foam developed by Dow Chemical Corp. from polystyrene. It is bonded in place by a special metal-to-plastic adhesive.

► **Various Formulations**—Results obtained with one of the Lockfoam formulations, designated 446 and cured at 200°F, was revealed by Lockheed's laboratory division chief J. M. Gerschler, at the recent National Aeronautic Meeting of the Society of Automotive Engineers, Los Angeles.

Other formulations have been and are now being investigated, but these are still on the confidential list.

Lockheed chemists Eli Simon and F. W. Thomas are credited with key

research in the creation of Lockfoam, which involves special additives developed by Lockheed, combined with commercial chemicals, it is reported.

► **Trial in Model**—Initial application of the foamed plastic came about when Lockheed's structures research group was checking the aeroelastic properties of a proposed delta wing design. The test article—a scale model—had a scaled-down skin gage that turned out to be too flimsy for the job. Lockheed engineers believed they could salvage the model by filling the wing cavity with some light material.

The company's chemical research group was called in and one of the foamed formulations they were then investigating was tried. Other materials could have been used if Lockheed engineers had decided to dismantle the wing and insert and cement in tailor-made fillers, but the simplicity of the foaming operation carried more appeal. Results of the application were entirely satisfactory. This paved the way for full exploitation of the material chemically and structurally.

► **Three Tests**—One of the first structural applications, Gerschler reveals, was for a representative control surface tab—about 5 by 18 in. Three units of equal structural weight were made. One was a conventional riveted structure, another was filled with Lockfoam bonded to the covering, and the third, also Lockfoam-filled, had no bonding to the covering. Foam density was 8½ lb./cu.

Research Rides a Rocket

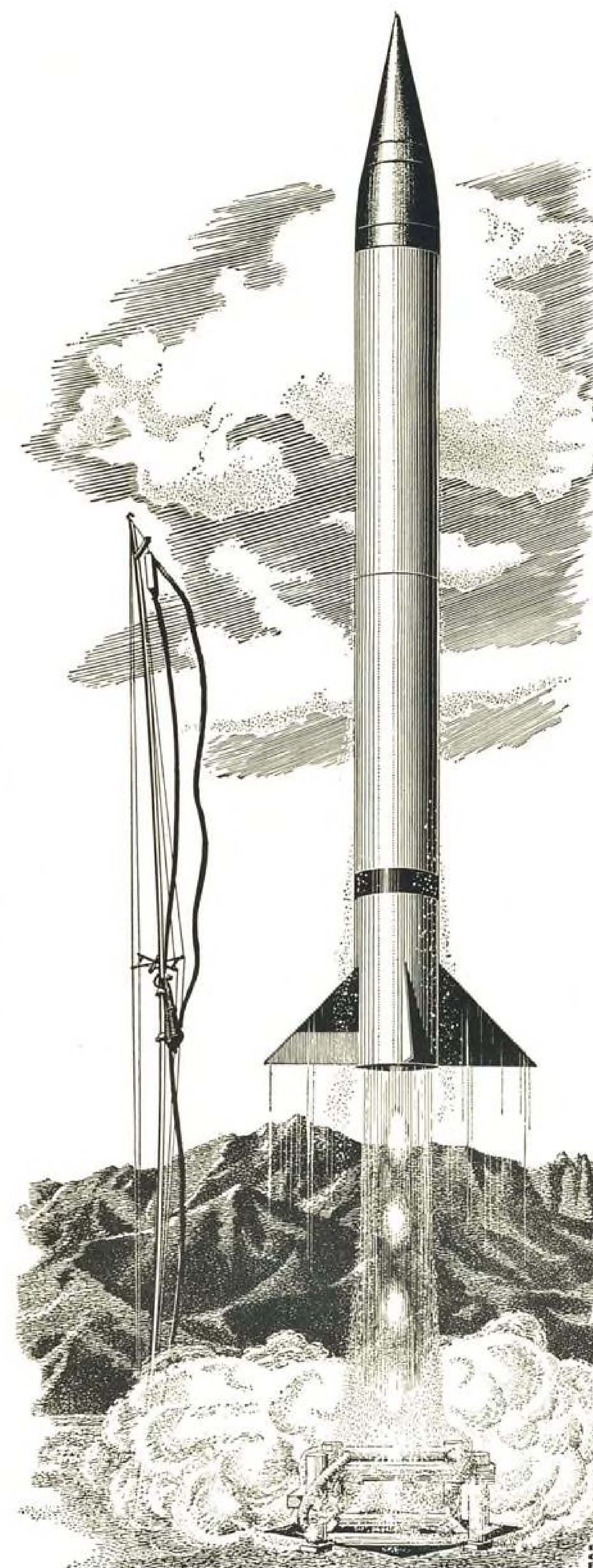
The Naval Research Laboratory's Viking rocket research at White Sands Proving Grounds, N. M., hunts facts, figures and formulas in the upper atmosphere.

HURTLING far into the blue, Naval Research Laboratory rockets ask questions of the earth's upper atmosphere . . . flash back the answers needed to guide the designers of tomorrow's piloted and pilotless super-altitude systems for peace or war. What are the pressures and temperatures of the earth's atmospheric layers . . . the high-altitude changes in the earth's magnetic field affecting navigational instruments . . . the alterations in radio waves caused by the ionosphere . . . the effects of sun spots on communications equipment out beyond the filtering effects of the earth's heavy atmosphere?

Martin Viking rockets play a major role in this high-altitude flight research program. Last summer, the Viking cracked the world's altitude record for single-stage rockets . . . nosing 136 miles into the heavens at a top speed of 4100 m.p.h. Now, an even more powerful Viking is being readied for launching. The Martin Company is proud to be a partner with the Naval Research Laboratory in these vital activities . . . helping to prove that America's most valuable secret weapon is its scientific leadership! THE GLENN L. MARTIN COMPANY, Baltimore 3, Md.

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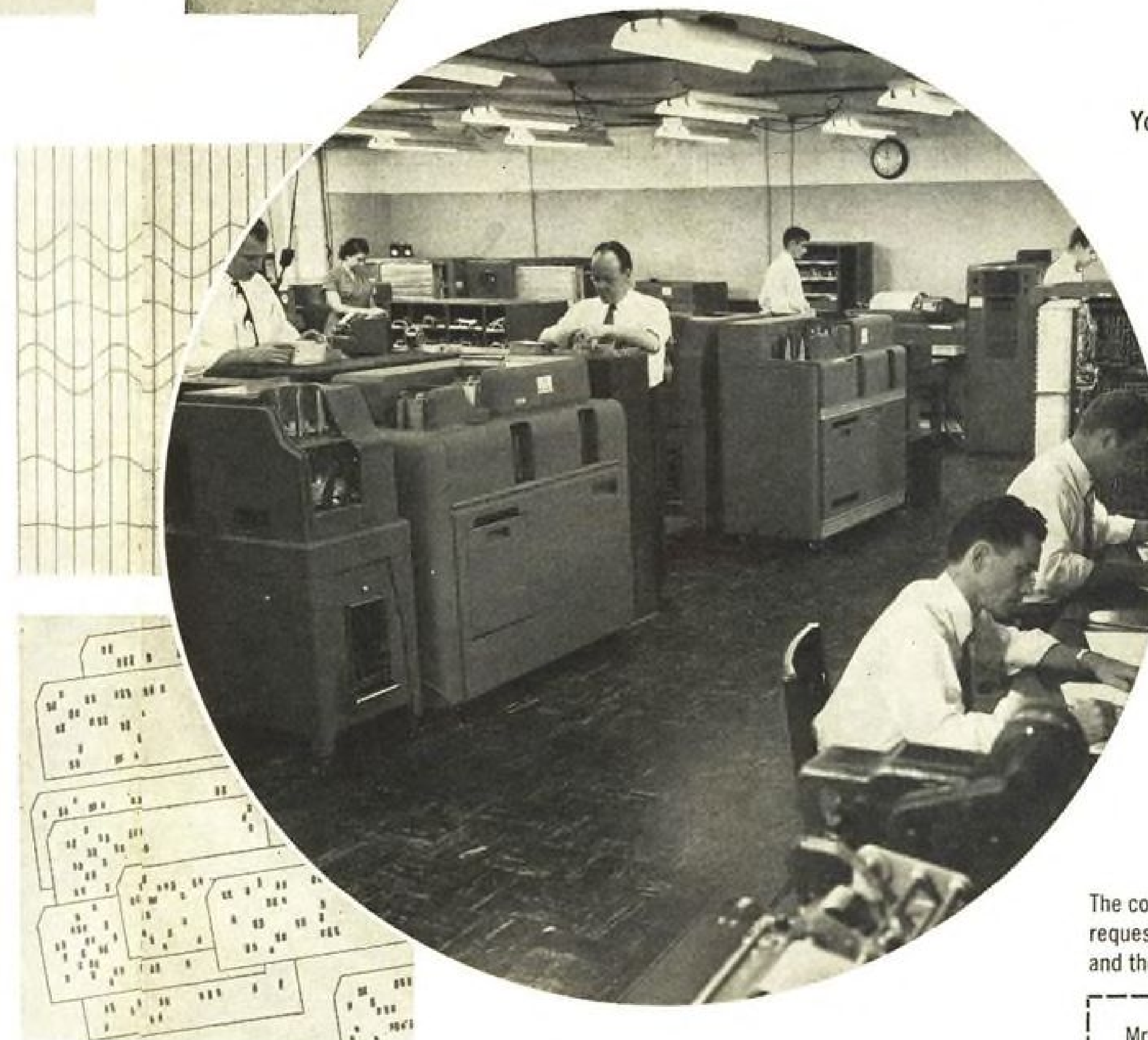
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ft. (Density range is 1½ to 35 lb./cu. ft.)

• **Conventional unit** was used as the control specimen. Loaded to 4±½ psi. and vibrated at 850 cpm. at room temperature, it failed at 300,000 cycles.

• **Lockfoam-filled and bonded-to-cover** tab under the same loading conditions at room temperature was given 300,000 cycles of vibration, then the same amount at 160F. and another 300,000 cycles at -60F—a total of 900,000 cycles without failure. After this it was static-tested to 12½ psi., where there was a slight buckling of the upper skin, which allowed foam separation in that area. The bonded foam structure also was 80% stiffer than the conventional makeup, an important consideration for highspeed aircraft.

• **Unbonded Lockfoam-filled** tab was given 300,000 cycles at room temperature. A slight cracking occurred in the trailing edge lower surface.

These tests demonstrated that the foamed plastic had definite structural uses and work was pushed to get those physical properties normally considered in design criteria.

► **For Radome**—Further development by Lockheed chemists eliminated aluminum powder used as the foam stabilizing agent. This came at a time when the project office was faced with the problem of providing a satisfactory radome for the all-weather F-94, relates Gerschler. Flat panels were made, checked for radar transmission characteristics and found to be better than anticipated.

A pilot plant was set up in the lab, tooling was designed and built, and 11 domes were quickly produced. Procedure was to pour the liquid into the mold cavity, then lower the upper (male) die into the lower die for a predetermined distance. Fiberglass inner and outer skins conformed to the contour of the mold within the accuracy of the tooling.

Static tests were satisfactory, trials established that noregun blast could be absorbed by the radome structure, flight tests indicated satisfactory radar performance and bore sight error was found to be well within specified limits, reports Gerschler.

► **For Door, Antenna**—Another application was with a rocket door that tended to buckle from the rocket blast. Designed with a double-skin combination of drop-hammered parts, the hollow spaces had some depth. Four holes (½ in.) were drilled for introduction of foam and the cavity filled with the foam fluid. Gerschler says that the result was satisfactory and no tooling changes were required.

Next application was with an antenna mast that was failing from fatigue. Here again, the cavity was merely filled with Lockfoam and the difficulty solved. No redesign was required and produc-



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to help you*

solve problems in design
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MAIL THIS COUPON TODAY

Dow Corning Corporation, Dept. D-22A
Midland, Michigan

Kindly include me among your guests at the
private showing of the Dow Corning Silicone
Exposition in

☐ St. Louis ☐ Buffalo
☐ Minneapolis ☐ Chicago
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"BRINGING the mountain to Mohamet might best
describe Dow Corning Corp.'s traveling exhibit...
Free standing panels... separate the exhibit into
nine bays, each emphasizing a property of silicones
and showing where that property brings a benefit
to an actual end product or operating unit..."
INDUSTRIAL MARKETING (June 1952)



"NEXT TO THE GREATEST SHOW ON EARTH...
We could go on... reciting the fantastic properties
of Silicones, but just as breathtaking as the
materials were the display techniques used to
demonstrate them..."
CIRCUIT RIDER (Vol. 6, No. 2, published by
Electrical Construction and Maintenance)



"... Heat Stability Plus: Visitors... see, among
other demonstrations, how Silastic (Dow Corning's
silicone rubber) remains soft and flexible at tem-
peratures far above the limits of organic rubber..."
CHEMICAL WEEK (Jan. 26, 1952)



"IF YOU HAVEN'T already seen it, don't miss it
when it comes around..."
POWER ENGINEERING (May 1952)

DOW CORNING



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Chicago
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Dallas
Los Angeles
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CANADA: Fibreglas Canada Ltd., 1200 Bay St., Toronto, Ontario
ENGLAND: Midland Silicones Ltd., 49 Park Lane, London, W.1

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Oct. 29, through Oct. 31.
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Nov. 11, through Nov. 13.
BALTIMORE
Nov. 18, through Nov. 20.
NEWARK
Nov. 4, through Nov. 7.
CINCINNATI
Oct. 21, through Oct. 23.
WINSTON-SALEM
Dec. 9, through Dec. 11.



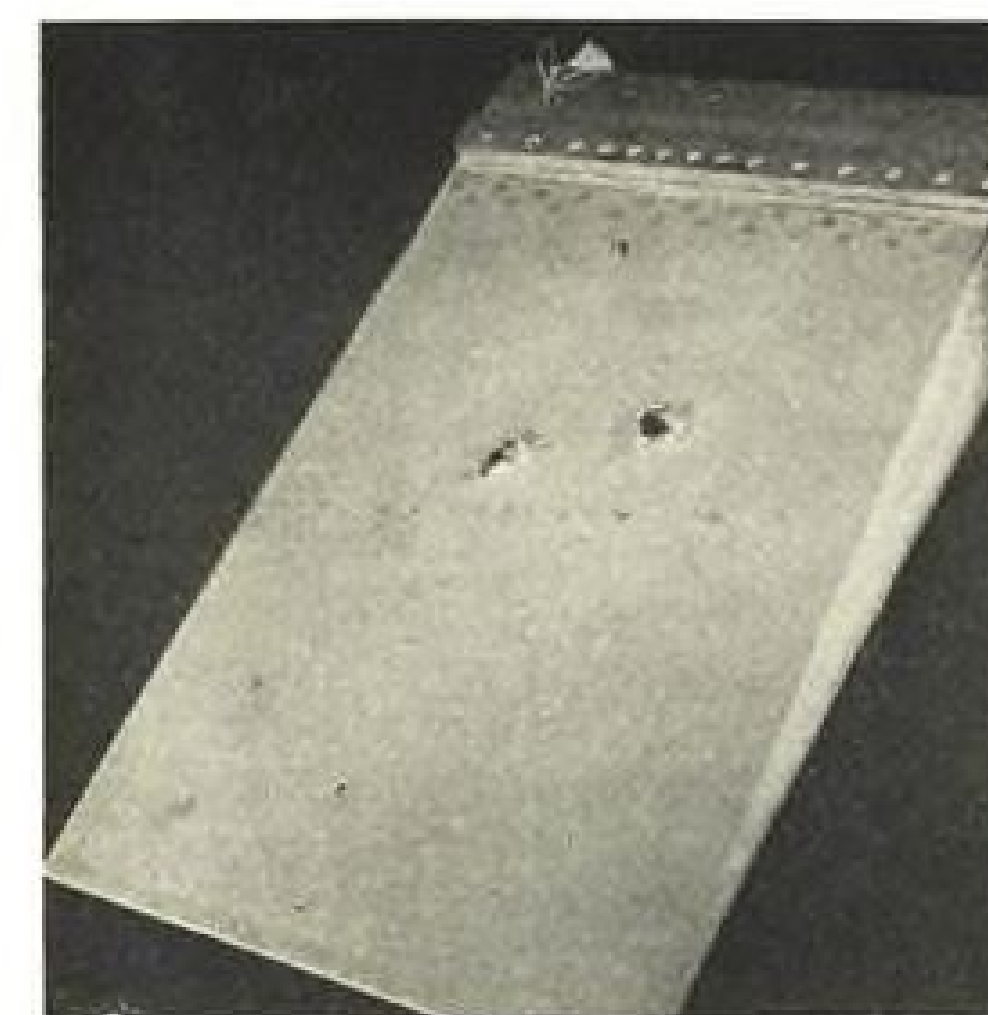
**DOW CORNING
SILICONES**... are no longer a mystery or a
"future possibility" to the 17,000 executives
and engineers, representing more than 4600
plants, who have already seen the
Dow Corning Silicone Exposition.*

They learned that silicones are fluids and resins
that keep clothes and shoes and brick walls
dry in the rain. They're fluids that
polish without rubbing.

They're rubber that won't melt on hot aircraft
engine cylinders or freeze on switches that
operate bomb bay doors at 100° below zero.

They're electrical insulating resins and varnishes
that double the power of electric motors, or
multiply by 10 the life of electric machines.

They're paints that protect metal at 1000°F.
They're foam killers and release agents.
They're a whole family of new engineering
materials that can help you to improve
your product or to cut production costs.



BULLET HOLES in aileron section can be
filled with wooden dowels.

tion shortages were, therefore, averted.
► **Under Fuel Tanks**—Another case re-
lated by Gerschler involved a shock-
board between self-sealing gas tanks and
the lower wing skin. Material is needed
in this location to absorb energy im-
parted by hydraulic ram when a bullet
passes through the wing and tank.

Other materials had been used for
this purpose, but Lockheed gave the
Lockfoam evaluation job to an outside
company. Gerschler says the report in-
dicated superior shock-absorbing quali-
ties for the foamed material. Another
advantage was that the density could be
specified.

► **Aileron Tried**—Next structural unit
tackled was a large one—aileron for the
latest version of the F-94. Pouring into
a cavity of this size posed problems.
Lightening holes in the aileron main
spar were used to inject the liquid. The
foam, Gerschler reports, rises vertically
from the trailing edge to the spar, ex-
cess material being extruded through
the spar holes.

Restraint introduced by the size and
spacing of the holes affects grain struc-
ture; hence first thing was to establish
optimum spacing of main spar holes.
Sample specimens about 2 ft. long were
made, being restrained from bulging in
a wooden jig. Samples were cross-
sectioned and inspected for grain and
cell uniformity. A few trials indicated
the best lightening configuration.

In a static test fixture, a completed
foamed aileron had its hinge line de-
liberately bowed to simulate the wing
bending curve. Loading condition was
brought up to 110% of design load.

► **Weathering Resistance**—Several full-
scale units were subjected to outdoor
weathering. After two years of exposure,
no adverse effects showed on one of the
units inspected. Cross-sectioned to
check on delamination, the skin-to-foam
bond tested satisfactory. Fungus trials
also checked out satisfactorily.

Completion of the aileron project
proved that the foam could be expanded
successfully in an irregular shaped cav-



Bonded Source Inspected

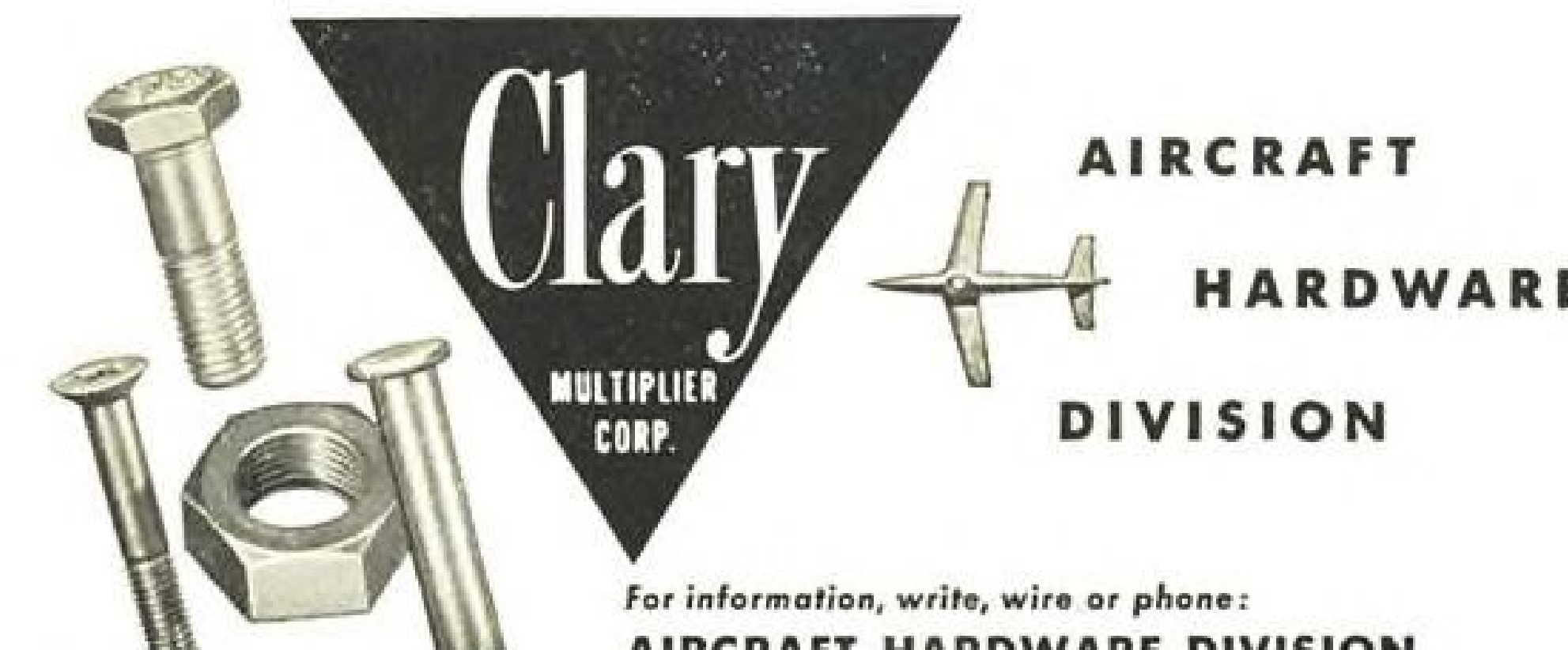
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1 All Clary aircraft fasteners are Source Inspected
Bonded Stock manufactured under Statistical
Quality Control. That combination is important to
you and it costs you no more!

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part number, specification, when manufactured and
by whom. Storage and inventory control is greatly
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money in the bank." If declared surplus they can
be disposed of at market prices without "red-tape."



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AIRCRAFT HARDWARE DIVISION
Serving the aircraft industry since 1941

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AVIATION WEEK, October 27, 1952

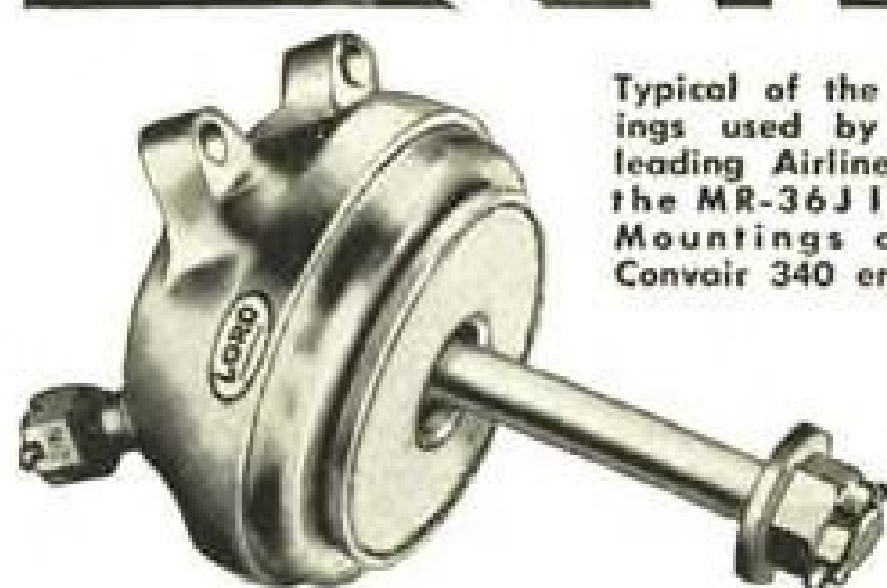
44 LEADING AIRLINES

INCREASE PAYLOAD

By Using LORD Mountings



Typical of the Lord Mountings used by the world's leading Airlines today, are the MR-36J lightweight Mountings on the new Convair 340 engines.



Pratt-Whitney R-2800 CB-16 Engines pack the power—and these new lightweight, low-cost Lord Mountings increase the payload approximately 10 lb. per engine... protect the air-frame from vibration... give passengers a smoother ride.

Lord Vibration Control Mountings are increasing payloads, protecting airframes, instruments and accessory equipment... adding to the comfort of passengers on 44 of the World's Leading Airlines. Why? Because Lord Engineering experience and manufacturing capabilities are providing light weight, low-cost mountings which contribute much to profitable airline operation. Lord engineering capabilities are being used to advantage by design engineers throughout world industry in their battle to isolate vibration and shock in a wide diversity of machines. Consult with Lord Engineers even before design takes shape on the board... and in perfecting machines already operating... You will profit.

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VIBRATION CONTROL

ity of fairly large size, Gerschler reports. He says other configurations may require some development as to pour locations, but that after some familiarization this should not be too difficult. ► **Characteristics**—During the foaming process, which is exothermic (liberates heat), considerable internal pressure is developed, reports Gerschler. This means that for certain shapes, restraining tooling is required. In large applications, he says, it is preferable to heat the tooling somewhat, then cure the assembly for a period after the expansion is complete. Internal pressure promotes adhesion and helps get the contour of the finished part as accurate as the tooling.

For the densities used in aircraft applications, moisture absorption is small. Gerschler says it is a simple matter to provide a suitable seal and that the material is resistant to aromatic solvents, engine oils, hydraulic fluids, and may be formulated so that it does not readily support combustion.

The plastic may be sawed, drilled and sanded like wood and has some grain effect, although not to the same degree as wood. Strength properties are affected by temperature.

► **Physical properties**—For formulation 446, cured at 200F, in tension and compression the effect of grain direction diminishes as the foam density increases, becoming negligible at a density of 18 lb./cu. ft. In shear, ultimate stress with load perpendicular to the grain remains about 90% of that with the load parallel to the grain, regardless of density. Effect of elevated temperatures is more pronounced in compression and shear than in tension.

In structural applications where maximum adhesion is wanted, Gerschler says it is desirable to coat the metal surfaces with one of the Bostick cements, while for many applications, such as the rocket door, zinc chromate primer permits satisfactory adhesion.

Temperature and amount of cure is dependent on the size of the unit involved. For the aileron application, one hour is required to bring the part up to 200F, where it is held for two hours.

► **Can Be Repaired**—Foam-filled structures are repairable, Gerschler reports. Delamination between core and skin can be detected by tapping with a rounded fiber rod. The repair can be made, he says, by injecting some cement (such as Epon) with a hypodermic needle. Alternate method is to drill a hole in the skin, apply a partial vacuum and allow cement to be sucked into another hole near affected area.

Lockheed has licensed the American Latex Products Corp., Hawthorne, Calif., and Nopco Chemical Co., Inc., Harrison, N. J., to manufacture Lock-foam and use it in marketing aircraft and commercial products.



WHO PUTS THE Air IN AIRCRAFT

Putting air to work *inside* aircraft is a Stratos specialty. Stratos designed and manufactured pneumatic equipment is serving vital functions in many military and commercial aircraft.

Whether it be the pressurizing and air conditioning of a modern transport, cooling the cockpit of a sonic fighter or operating indispensable accessories in a jet bomber, Stratos precision-engineered equipment meets the requirement. Stratos pressurization and cabin air conditioning systems are used by leading domestic and international airlines. Stratos air-cycle refrigeration units cool the fastest Air Force and Navy jet fighters and bombers. Light-weight Stratos air-turbine drives provide dependable power for accessories in jet night fighters and bombers.

AIR-TURBINE DRIVES from 3 to 100 hp.

CABIN SUPERCHARGERS from 20 to 75 lbs./min air flow



BOOTSTRAP AIR-CYCLE REFRIGERATION from 20 to 75 lbs./min air flow



JET BLEED REFRIGERATION FOR FIGHTERS from 10 to 30 lbs./min air flow

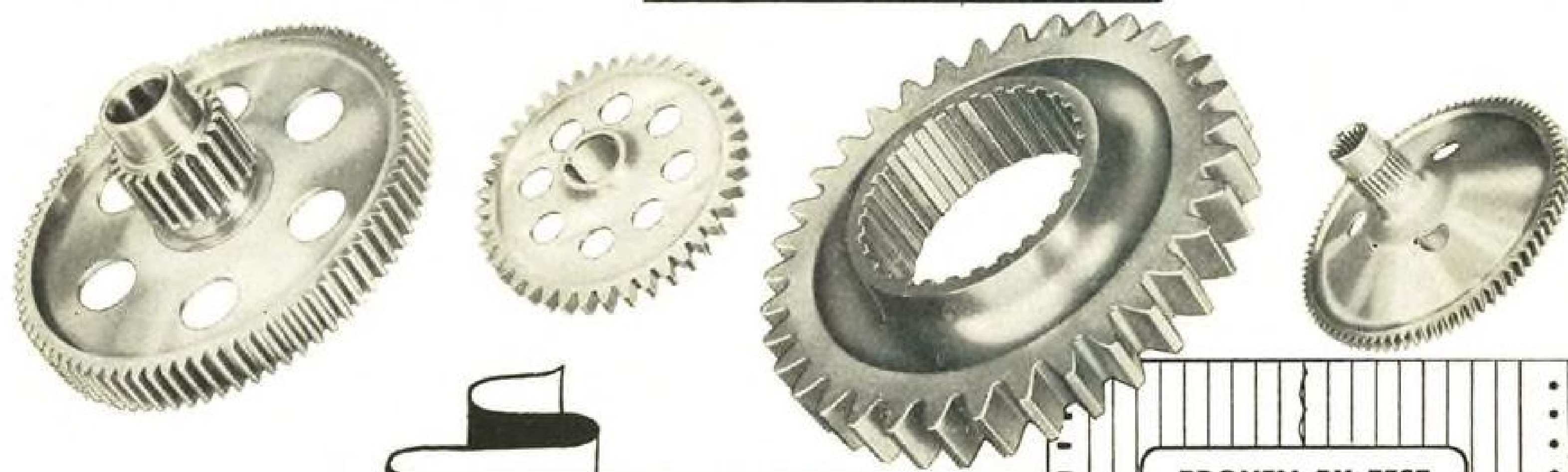


JET BLEED REFRIGERATION FOR BOMBERS up to 100 lbs./min air flow

Stratos DIVISION
FAIRCHILD ENGINE & AIRPLANE CORP.

Main Office and Plant: Bay Shore, Long Island, N. Y. • West Coast Office: 1355 Westwood Blvd., Los Angeles 24, Calif.
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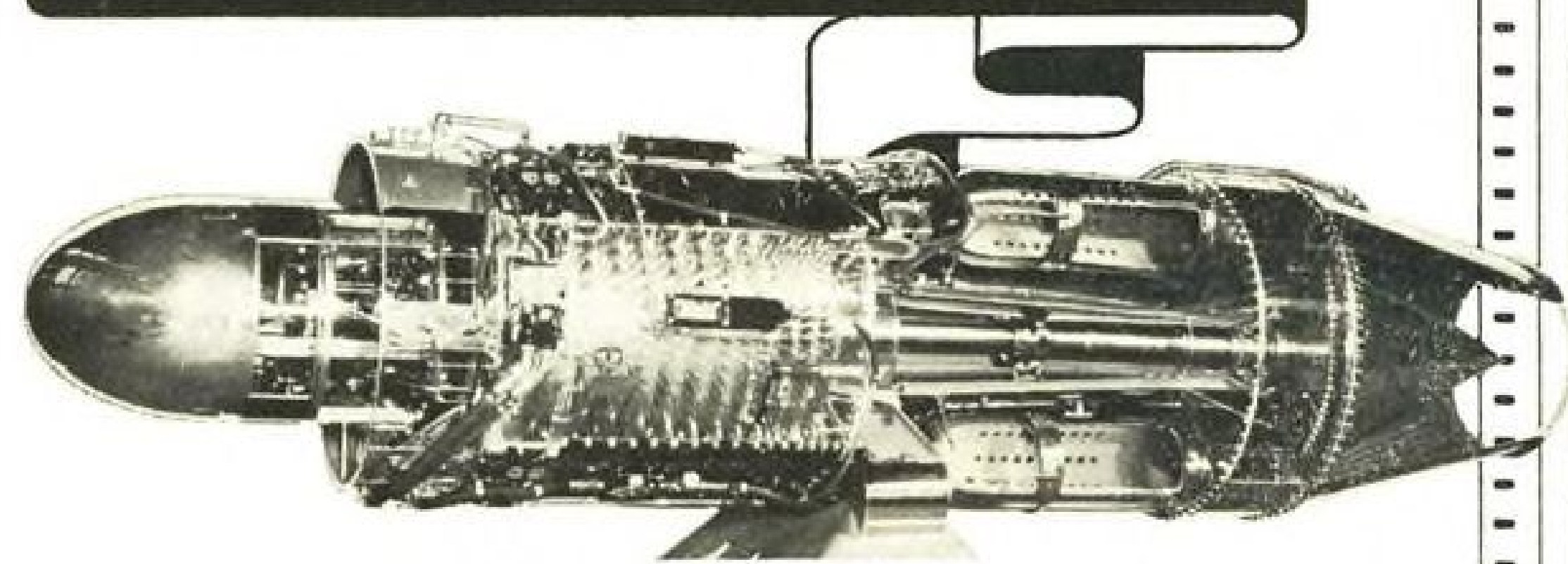
Sier-Bath PRECISION GEARS



PROVEN ACCURACY

PROVEN BY TEST
on the latest gear checking equipment. The chart shown here is from a "Red Liner" instrument, which records character, location and magnitude of six different possible errors.

FOR THE AIRCRAFT INDUSTRY



General Electric J47-GE-13 Engine, cut-away model



Martin XB-51 Tactical Bomber — powered by three General Electric J47-GE-13 Engines



North American B-45 "Tornado" Bomber — powered by four General Electric J47-GE-13 Engines

PROVEN BY USE
in today's leading aircraft. For example, Sier-Bath gear components are used in General Electric J47-GE-13 Engines . . . which power the two aircraft shown at left, among many others.

Sier-Bath GEAR and PUMP CO., Inc.

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Established 1905

Member A.G.M.A.

Also manufacturers of Screw and "Georex" Rotary Pumps, and Flexible Gear Couplings

Solar Builds Plant For Ceramic Coats

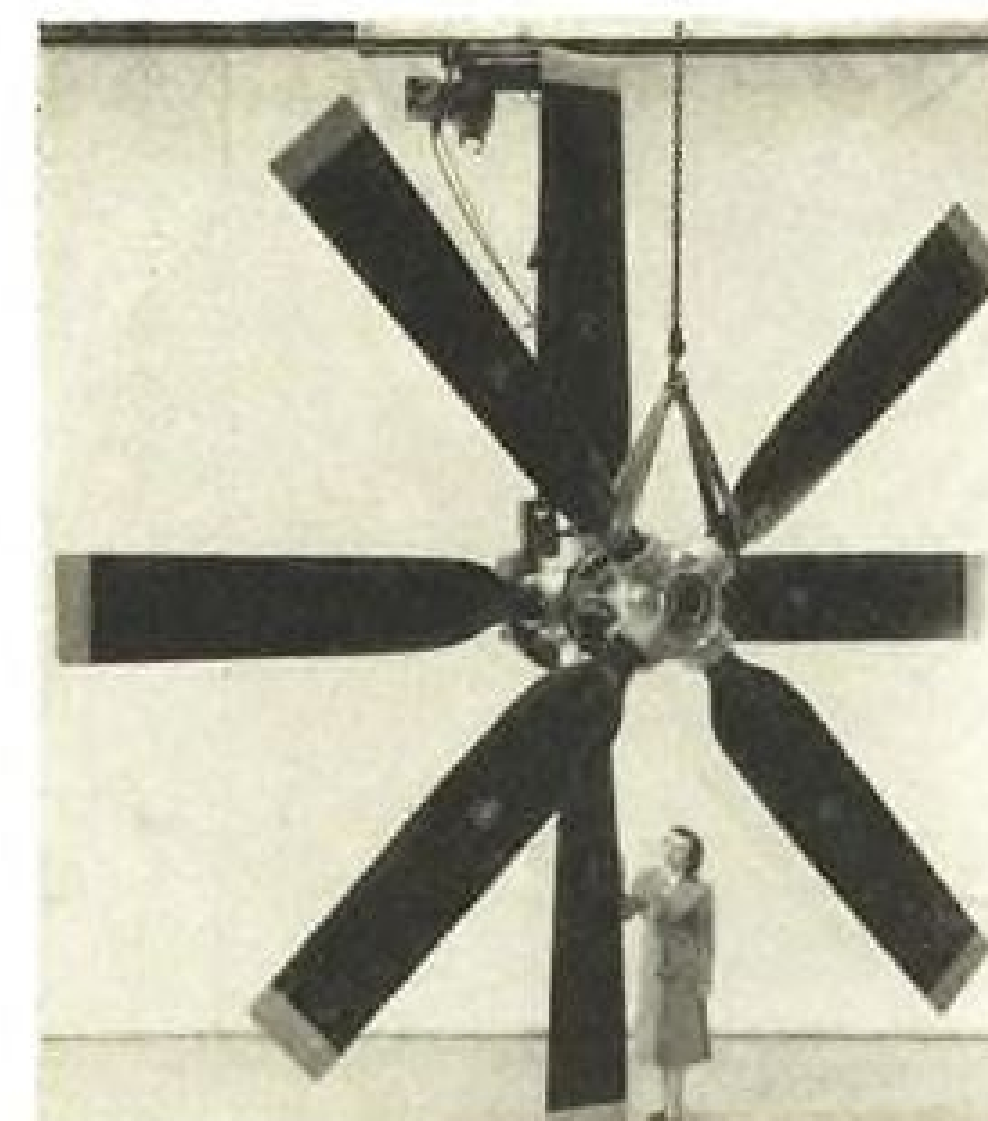
Solar Aircraft Co. is building a new ceramic-coating production facility at San Diego, scheduled to save strategic metal. It will use the company's Solar-amic process to coat inner combustion chamber and transition liners for General Electric's J47 jet, to reduce oxidation and corrosion resulting from high temperatures.

The method, Solar reports, allows substitution of leaner alloys for those rich in strategic elements, with equal or longer service life for the coated parts. Jet engine parts can be made from AISI Type 321 stainless containing only 8% nickel, instead of Inconel, which contains 78% nickel.

The process also is being applied to piston-engine components.

Magnesium Press for Dow

A new 3,000-ton extrusion press built by Hydropress, Inc., New York, will squeeze out magnesium alloys at Dow Chemical Corp.'s Madison, Ill., plant. The press incorporates stepless adjustment of extrusion speed from both the main operating pulpit and auxiliary control stand at the platen exit. The machine and its induction heating furnace are semi-automatic in operation, require but little attention.



TURBOELECTRIC PROP

This huge propeller, one model in Turboelectric series developed by Curtiss-Wright for high-power turboprop application, is 18-ft.-diameter, 8-bladed dual rotation unit capable of harnessing 15,000-hp. output. Other units in series will take up to 20,000 hp. and some span up to 20 ft. Company reports that models have been designed for Allison T38 and T40 and Pratt & Whitney T34. The Turboelectrics supplement new turboprop engine developed by C-W's Wright Aeronautical division, "expected to dwarf in power any aircraft engine yet made public."

(Advertisement)

Valve Talk

for WM. R. WHITTAKER CO., Ltd.

by Marvin Miles,
Senior Member, Aviation Writers Assn.



In gathering facts for these Valve Talks I've plagued myself with a constantly recurring question: "How can any company expand as rapidly as Whittaker has and still maintain such an excellent management-employee relationship?"

I think I know the answer now. It's this — Whittaker, like many another company, offers fair pay, security and opportunity. And then they go further. They recognize their people as individuals.

Time and again I've heard Whittaker employees express themselves in this general vein: "It's a good company. People are friendly and cooperative. Doesn't matter if you're running an air gun or carrying boxes, nobody looks down on you. You have a feeling of belonging, of sharing. And if you've got a problem you can take it to anyone at the top."

Many a firm boasts of such employee approval. Whittaker has earned it without the familiar two-faced tinge of paternalism.

My guess is that this atmosphere of congeniality, lacking the conflicts that so often typify the industrial scene, goes back to President Bob Whittaker and his natural liking for people.

The same trait is quickly obvious in the men he has selected for executive positions — in the people they have named to direct departments — and in the employees themselves.

In talking with workers at the assembly benches and in the laboratories, I found them not only interested in their own futures, but in their company's future as well, with appreciation for the correlation between self-improvement and company improvement.

Joe Wehrly, Personnel & Industrial Relations Director, confirmed my observations. He believes that this general feeling among some 1500 employees is the result of Bob Whittaker's constant challenge to his organization.

"Bob feels," he said, "that cooperative people in pleasant surroundings cannot help but turn out good, efficient work. This, in turn, results in increasingly better products at lower cost to our consumers . . . and they're the ones who, in the end, determine our success."

In speaking of fair pay, Wehrly reported that wages and salaries are based on community and industry schedules, plus internal job evaluation which considers skill, effort, responsibility and working conditions in determining the relative value of each

job. All jobs are ranked in a single interplant rate structure.

This established plan of pay administration, approved by both the Wage and Salary Stabilization Boards, has allowed (by regulations to date) general and cost-of-living increases, as well as merit increases (contingent upon quarterly merit-rating reviews) within the board-approved rate ranges.

In addition Whittaker has arranged for a number of important Fringe Benefits for their employees that include company-paid group insurance, additional appropriations for shift differentials, rest periods with coffee, paid vacations and holidays, military termination pay, a buying service, a federal credit union with assets totaling more than \$175,000.00 (among the top 15% in the nation), and the highest company paid profit sharing retirement plan allowed by Treasury Department regulations.

Of security, Wehrly explained: "Efficient and effective customer service, achievement of good performance records — these plus seniority recognition, everything else being equal — represent security."

Of opportunity, Whittaker considers: first, effective hiring and placement; second, on-the-job training; third, promotion from within the organization wherever possible, consistent with initiative and ability.

I learned many things about Whittaker personnel. I saw the excellent job being done at Whittaker by disabled war veterans and the handicapped. I found out that the average age of supervisory personnel in the company is well under 40.

And of the youngsters who apply for work and go into job training, I was told:

"If they have promise, we take them. But we'd like them to have worked somewhere else for a short time first, not so much for the experience, but so they can have a clear comparison of Whittaker employment with that of other concerns."



Question:

Does air travel cost more or less per mile than 10 years ago?

Answer:

While the cost of living has almost doubled, air travel today costs less per mile than a decade ago.

Question:

Which Aviation Fuel in the U. S. A. today flies the most passengers?

... the most air freight?
... the most air mail?

Answer:

SHELL AVIATION FUEL

SHELL OIL COMPANY

50 WEST 50TH STREET, NEW YORK 20, N. Y.
100 BUSH STREET, SAN FRANCISCO 6, CALIFORNIA



USAF CONTRACTS

Following is a list of recent USAF contracts announced by Air Materiel Command:

Continental Screw Co., New Bedford, Mass., screws, \$34,831.

Cornelius Co., 550 39 Ave., N. E., Minneapolis, air compressors, \$334,693.

DeFrenes Co., 1909 Buttonwood St., Philadelphia, prod. of motion picture, storyboard, release prints, \$73,164.

DiNoe Co., 1700 London Rd., Cleveland, photographic film, \$326,840.

Dow-Elco Inc., 1313 West Olympic Blvd., Monte Bello, Calif., engine shock mounts, \$31,224.

Dumont Electric Corp., 308 Dyckman St., New York, capacitor, 20,000 ea., \$27,000.

Dumore Co., 1300 17 St., Racine, Wis., grinders, 145 ea., \$27,332.

Duo Photo Corp., 30 W. 25 St., New York, printer, tag list/parts, literature, tech manuals & dwgs., 130 ea., \$41,508.

Dye Machine & Supply, R. E., 207 W. Williams St., Breckenridge, Tex., shackle, bomb, and spare parts, 1,651 ea., \$48,154.

Dynamic Electronics New York, Inc., 73-39 Woodhaven Blvd., Glendale, L. I., N. Y., control C-463/APG-3-spare parts, 131 ea., engr. data, 1 set, \$28,488.

Eclipse-Pioneer div., Bendix Aviation Corp., Teterboro, N. J., indicator, A-15, \$120,112; bubble, sextant, 1,600 ea., \$154,512; fuel flow transmitter, 966 ea., \$226,440; engine instr. maint. parts, 59 ea., \$131,504; transmitters, 741 ea., \$42,756; fuel flow indicator, 215 ea., \$50,077.

Elastic Stop Nut Corp., 2330 Vauxhall Rd., Union, N. J., self-locking nuts, \$37,378.

Electrical Eng. & Mfg. Corp., 4612 W. Jefferson Blvd., Los Angeles, actuators, 10 ea., \$39,364.

Everybody's Office Outfitter, Inc., 17-19 W. Fifth St., Dayton 2, chair, 13,454 ea., \$158,084.

Federal Engr. Co., 37 Murray St., New York, dryer, 70 ea., \$45,662; printer, 389 ea., \$43,293.

Federal Telephone & Radio Corp., Clifton, N. J., RF coax. cable, 165,000 ft., \$74,350.

General Electric Co., 118 W. First St., Dayton, regulator, 800 ea., \$172,872.

General Electric Co., Schenectady, N. Y., indicator, 872 ea., \$84,225; indicator, 342 ea., \$36,109; switches and relays, 9 ea., \$61,174.

General Products Co., Inc., 82-96 Hadiver St., Central Falls, R. I., filing cabinets, 4,510 ea., \$204,754.

Goodrich Co., B. F., 803-4 Winters Bank Bldg., Dayton wheel assembly, 8,500, 6,200 ea., wheel assembly, 27", 500 ea.; tail wheel assembly, 8,000, 300 ea., \$43,097.

Grimes Mfg. Co., Urbana, Ohio, spare parts, 18 ea., \$31,145.

Hamilton Mfg. Co., Two Rivers, Wis., laboratory equipment, 1 lot, \$40,777.

Harris-Seybold Co., 4510 E. 71 St., Cleveland, printing presses, 8 ea., \$195,192.

Heckman Co., 4528 S. Broadway, St. Louis, costumers, 16,235 ea., \$89,130.

Eclipse-Pioneer div., Bendix Aviation Corp., Teterboro, N. J., maintenance parts, \$43,508; fuel flowmeter transmitters, 1,050 ea., \$188,244.

Edison, Thomas A., Inc., 51 Lakeside Ave., West Orange, N. J., temperature indicator, 957 ea., \$33,382.

Fairchild Camera & Instrument Corp., 88-06 Van Wyck Blvd., Jamaica, N. Y., camera mounts, 100 ea., \$76,502; Rapidyne shutters, \$91,313.

Fameco Machine Co., Racine, Wis., drilling machine, 593 ea., \$73,965.

Federal Telecommunication Laboratories, Inc., 500 Washington Ave., Nutley, N. J., direction finding units, 4 ea., \$235,212.

Felsenthal, G., & Sons, Inc., 4100 West Grand Ave., Chicago, Weems aircraft plotters, 110,000 ea., \$43,982.

Firestone Tire & Rubber Co., 2525 Firestone Blvd., Los Angeles, cell fittings, \$98,233.

General Tire & Rubber Co., 1708 Englewood Ave., Akron, Ohio, cone, 15,816 ea.,

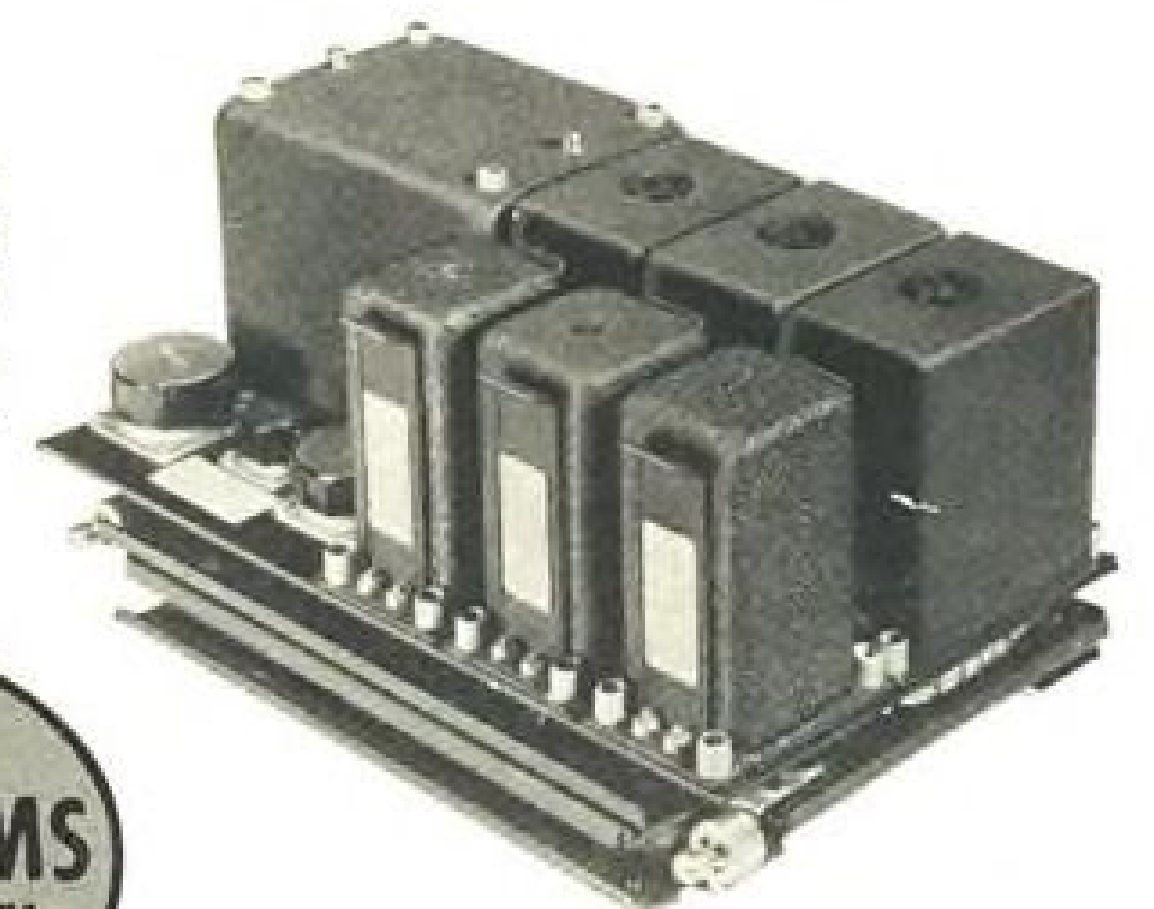


...simplified by "building block" electronic packages makes possible synthesis of present and future aircraft control systems.

Servomechanisms, Inc., has pioneered in developing functionally-packaged standard plug-in units for electronic and electromechanical aircraft instrumentation. Servomechanisms technique of MECHATRONICS...the multiple and interchangeable use of standard units achieves simplified control systems which solve the aircraft need for:

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AVIATION WEEK, October 27, 1952



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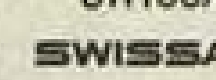
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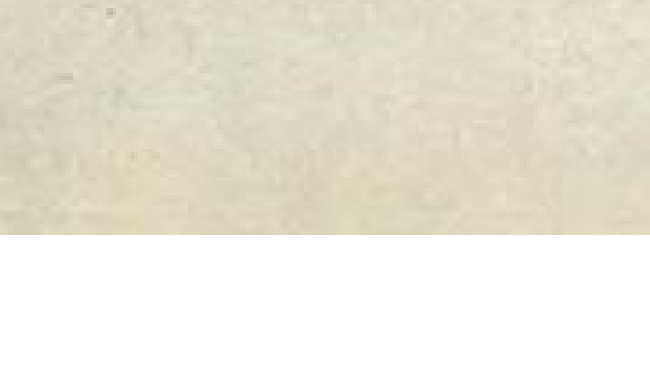
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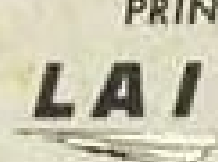
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*Now serving these leading airlines... or on order... are
417 Douglas DC-6s and DC-7s... the largest
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These modern men of vision are aiding the cause of peace. Their airlines make possible swift interchange of ideas and free movement of trade between nations, and are the common denominators of mutual trust and understanding. The men and women of Douglas are proud to have played a part in the

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First in Aviation

To Men in Aviation Manufacturing and Maintenance:

IF YOU USE ANY OF THESE ITEMS

Aircraft Components

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| <input type="checkbox"/> Fuses | <input type="checkbox"/> Terminals, Connectors |
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| <input type="checkbox"/> Fuseholders | <input type="checkbox"/> Test Clips |
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Goodrich, B. F. Co., 803-4 Winters Bank Bldg., Dayton, wheel assembly, 250 ea., \$59,085; wheel assembly, \$63,164.

Goodyear Tire & Rubber Co., Inc., 1144 E. Market St., Akron, fuel cell fittings, \$63,287.

Graham Transmissions, Inc., 3754 N. Holton St., Milwaukee, transmission, 134 ea., \$39,375.

Gremco, Inc., 206 E. Daggett St., Ft. Worth, diesel generators, \$125,744.

Hoffman Radio Corp., 3761 South Hill St., Los Angeles, radio receiver-transmitter, 14-506 ea., \$1,120,788.

Superior Togs Corp., 32 7th St., Elizabeth, N. J., gloves, suits, hoods, \$63,769.

Wagner, The Ferd. Co., 817 Main St., Cincinnati, photo equipment, \$87,840.

Watts Mfg. Co., Inc., Ronceverte, W. Va., kit, 426 ea., \$161,903.

Weatherhead Co., 300 E. 131st St., Cleveland, adapter, 14,000 ea., \$55,020.

Weldon Tool Co., 3000 Woodhill Rd., Cleveland, de-icer pumps and spare parts, \$26,777.

Western Electric Co., 195 Broadway, New York, cable, \$36,939.

Western Mfg. Co., Scotten Ave., Detroit, spare parts, \$215,197.

Weston Electrical Instrument Co., 614 Frelinghuysen Ave., Newark, N. J., ammeter-direct current, 4,000 ea., \$28,560.

Wysong & Miles Co., 625 Fulton St., Greensboro, N. C., drill press, 97 ea., \$143,317.

Kenwar Inc., 50 Church St., New York, telephone tech. orders, \$166,195.

Royal Electric Co., Pawtucket, R. I., wire, 71,000 lb., \$43,085.

Saval div., Wm. R. Whittaker Co., Ltd., 918 N. Citrus Ave., Los Angeles, valve assembly, \$30,535.

Schaffer Air Industries, Inc., 37-15 11th St., Long Island City, N. Y., propeller control, 431 ea., \$47,766.

Scott Aviation Corp., 207 Erie St., Lancaster, N. Y., breathing unit, \$60,797.

Seeger Refrigerator Co., 850 Arcade St., St. Paul, fuel tanks, 10,000 ea., \$3,258,300.

Simmonds Aerocessories, Inc., 105 White Plains Road, Tarrytown, N. Y., instrument maintenance parts, 23 items, \$25,333.

Skinner Purifier div., Bendix Aviation Corp., 1500 Trombly Ave., Detroit, filter elements, \$50,000 ea., \$99,500.

Specialty Products Co., 1965 E. 66th St., Cleveland, coupling clamps, 20,500 ea., \$37,925.

Technical Service, Inc., Plymouth, Mich., spare parts, \$148,057.

Tensor Electric Development Co., 343 Classon Ave., Brooklyn, N. Y., tester, aviation ignition, 775 ea., \$146,880.

United States div., American Machine & Metals, Inc., Sellersville, Pa., multi-purpose transmitters, 384 ea., \$46,275; fuel pressure transmitters, 601 ea., \$62,806.

United States Rubber Co., 1230 Avenue of the Americas, New York, aircraft hose, \$56,998; aircraft hose, \$578,369.

Wagner, E. R., Mfg. Co., 4611 N. 32nd St., Milwaukee, hinge, 91,200 ea., \$80,571.

Western Associate, Inc., 1055 County Rd., San Carlos, Calif., fluid anti-icing, 73,355 gal., \$47,741.

White Tuning Co., 421 W. 54th St., New York, phase adapters, 3,067 ea., \$53,580.

Wolff, Raphael G., Studios, 1714 N. Wilton Place, Hollywood, Calif., film, 1 ea., \$47,321.

Worch, F. E., Machinery Co., Columbus, shears, 14 ea., \$67,900.

Adel div., General Metals Corp., 10777 Van Owen St., Burbank, solenoid & plunger assemblies, \$241,241.

Advance Gear & Machine Corp., 5851 Holmes Ave., Los Angeles, modification kits, 1,275 ea., \$90,576.

Elastic Stop Nut Corp. of America, 1027 Newark Ave., Elizabeth, N. J., fixture, \$156,175.

Aircraft Hdw. Mfg. Co. Inc., 810 Edge-water Road, New York, bolts, \$25,016.

Aircraft Tools Inc., 9030 Bellanca Ave., Los Angeles, pneumatic rivet shaver, 1,029 ea., \$90,872.

AiResearch Mfg. Co., 9851-9951 Sepulveda Ave., Los Angeles, kit assemblies, \$62,525.

Alco Deree Co., 4300 N. California Ave., Chicago, steel bar, 3,676,000 lb., \$347,162.

American Automatic Typewriter Co., Chicago, dryer, spare parts & data, \$201,735.

American La France Foamite Corp., 100 E. La France St., Elmira, N. Y., spare parts, \$26,842.

Bendix Products div., Bendix Aviation Corp., South Bend, Ind., main wheel assembly, \$62,531.

Bendix-Westinghouse Automotive Air Brake Co., Elyria, Ohio, spare parts, \$49,552.

Bienenfeld Glass & Mirrors, \$624 Bellanca Ave., Los Angeles, sheet glass, \$35,480.

Billey Electric Co., Union Station Bldg., Erie, Pa., crystal holder, 13,500 ea., \$64,040.

Borce Crane Co., 930 W. Central Ave., Toledo, woodworking surfacer, 40 ea., \$33,804.

Brown-Brookmeyer Co., The, 1000 Smithville Rd., Dayton, buffer & grinder, \$32,044.

Buhl Optical Co., 1009 Beech Ave., Pittsburgh, filter assembly, \$51,105.

Busch Camera Corp., 500 S. Clinton St., Chicago, camera, spare parts & data, \$688,449.

Camloc Fastener Corp., 420 Lexington Avenue, New York, receptacles & stud assembly, \$45,129.

Cherry Rivet Co., Townsend Co., 231 Winston St., Los Angeles, rivets, 5,091,000 ea., \$98,202.

Cleveland Automatic Machine Co., The, Cincinnati, automatic screw machine, 2 ea., \$25,037.

Coates Electric Mfg. Co., 3610 First Ave., So., Seattle, electric furnace, \$552,570.

Colorado Fuel & Iron Corp., WickWire Spencer Steel, Clinton, Mass., wire cloth, \$63,196.

Continental Screw Co., 459 Mt. Pleasant St., New Bedford, Mass., screws, 3,624,000 ea., \$28,118.

Custom Products, 312 S. Ashley St., Ann Arbor, Mich., trainer mockup gyro instrument, \$40,866.

Detroit Diesel Engine, GMC, 13400 West Outer Drive, Detroit, spare parts, \$56,679.

Deutsch Co., The, 7000 Avalon Blvd., Los Angeles, plug, \$25,536.

Dial Screw Products Co., Inc., 32-21 58th St., Woodside, N. Y., Monel tubular rivet, \$25,542; bolts, \$49,348; rivets, 23,790 lbs., \$31,539.

Dumont Aviation Inc., 1401 Freeman Ave., Long Beach, Calif., radio receivers, 920 ea., \$64,400.

Dzus Fastener Co., Inc., Box 185, Babylon, N. Y., cowl fasteners, \$96,466.

Acushnet Process Co., New Bedford, Mass., oxygen masks, 4,153 ea., \$80,660.

Advertising Displays, Inc., 419-423 Pike St., Covington, Ky., kits: ventilator, 668 ea., U-1, 717 ea.; A-1, 261 ea.; A-2, 66 ea.; \$1,090,334.

Aeroquip Corp., 303 South East Ave., Jackson, Mich., spare parts, hydraulic base and fittings, \$57,107.

AGA div., Elastic Stop Nut Corp., Elizabeth, N. J., filter assembly, green, 3,728 ea.; filter assembly, red, 9,340 ea.; overrun high intensity light, 7,000 ea.; \$151,767.

Aircraft Radio Corp., Boonton, N. J., radio receiver R-11A-14V, radio receiver R-15-14V, radio transmitter R-11-28V, loop antenna L-10A-14V, dynamotor D-10A-14V, antenna A-12-14V, misc. parts J-12, J-10, C-24, 14V, \$59,771.

AiResearch Mfg. Co., 9851 Sepulveda Blvd., Los Angeles, actuator assembly, 230 ea., \$66,864; actuators, thermostats and flexible shafting, 9 ea., \$285,413; thermostat, 600 ea., actuator assembly, 670 ea., \$339,789; maintenance overhaul parts, \$37,245.

Aluminum & Brass Co., Inc., 120 Church St., Lockport, N. Y., helium valves, 10,000 ea., nitrogen valves, 4,000 ea., \$27,300.

American Automatic Typewriter Co., 614 N. Carpenter, Chicago, dryer, spare parts, 238 ea., \$139,243.

American Bosch Corp., 3664 Main St., Springfield, Mass., magneto assemblies, \$65,696.

American Brake Shoe Co., 97 Hanbolt St., Rochester, N. Y., portable air compressors, 120 ea., \$30,380.

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American Coleman Co., The, 340 WOW Bldg., Omaha, fabrication of spare automotive parts, 212 ea., \$85,147.

American Phenolic Corp., 1830 S. 54th Ave., Chicago, cable, 297,500 ft., \$29,317.

American Seating Co., 1776 Broadway, N. Y., chair, 4,538 ea., \$41,823.

Ampro Corp., 2851 N. Western Ave., Chicago, miscellaneous parts, \$58,659; photographic spare parts, \$30,427.

Arkwright Finishing Co., 809 Industrial Trust Bldg., Providence, R. I., tracing cloth, \$89,180.

Armstrong-Blum Mfg. Co., 5700 W. Bloomingdale Ave., Chicago 39, hacksaw, power, 14 ea., \$49,027.

Armstrong Furnace Co., Columbus, type M-2 dolly, spare parts, 359 ea., \$157,524.

Aro Equipment Corp., Bryan, Ohio, assemblies and sub-assemblies, \$53,181.

Atlantic Parachute Corp., 750 Suffolk St., Lowell, Mass., canopy assembly, 12,000 ea., \$1,039,440; CP duck, 5,000 ea., \$37,750.

Avon Electrical Supplies, Inc., 145-14 Jamaica Ave., Jamaica, N. Y., panel, power distribution, 128 ea., \$33,152.

Baldwin-Lima-Hamilton div., Eddystone div., Philadelphia, stand assembly, 8 ea., \$75,054.

Barber Metal Products, Inc., 214 West Jefferson St., Goshen, Ind., locker-steel, wall, 73,993 ea., \$1,294,348.

Bausch & Lomb Optical Co., 635 St. Paul St., Rochester, lensvisor, flying helmet, 13,312 ea., \$43,663.

Beldin Mfg. Co., Chicago, cable, 4,626,000 ft., \$265,126.

Bellevue Indus. Furnace Co., Detroit, furnaces, 67 ea., \$215,976.

Bell & Howell Co., 7100 McCormick Rd., Chicago 45, splicers & accessories, \$33,437; spare parts, \$50,153; camera & spare parts, \$162,412; photographic spare parts, \$152,269; spare parts, \$54,540; parts for PH-330 cameras, \$47,721; film splicers, \$93,508; spare parts, \$58,625; miscellaneous photographic equipment, \$87,979; maintenance parts, \$25,233; spare parts, \$192,729.

Belnap & Thompson Inc., 1516 S. Wabash Ave., Chicago, survival kits, 10,000 ea., \$348,150.

Bendix Radio, Bendix Aviation Corp., Baltimore, components, 12,000 ea., \$17,780,000; components, 2,726 ea., \$3,024,500.

Binks Mfg. Co., Chicago, spray guns & equipment, adapters, 2,000 ea.; extension handles, 1,000 ea.; pressure tank, 976 ea., \$81,890.

Blaw-Knox div., Blaw-Knox Co., P. O. Box 1198, Pittsburgh 30, towers, 6 ea., \$34,027.

Blick-Mig Co., 2601 Madison St., Kansas City, Mo., miscellaneous aircraft protective covers, 8,180 ea., \$224,936.

Boeing Airplane Co., 7755 East Marginal Way, Seattle, spare parts, \$95,732; special tools, 5 sets, \$123,624.

Boice Crane Co., 930 West Central Ave., Toledo 6, drill press, bench type, 250 ea., \$30,922.

Brown & Mole, Inc., Strong Ave., Prague, L. I., N. Y., carrier, aerial tow target banner, 274 ea., \$131,213.

Brunswick Aircraft Supply, Inc., 1771 North San Fernando Blvd., Burbank, Calif., magneto parts, \$53,000.

Buchsbaum & Co., S., 1737 S. Michigan Ave., Chicago, cover assembly, 2,155 ea., \$57,457; miscellaneous aircraft protective covers, 1,995 ea., \$64,284; aircraft protective covers, 6,929 ea., \$91,366; buffer panels, 18,663 ea., \$309,858; aircraft protective covers, 4,175 ea., \$112,050; survival kits, 5,000 ea., \$272,125; kit, aerial delivery, \$101,846.

Burton-Rodgers, Inc., Blade & Helen Sts., Cincinnati, animated panel mock-up, 15 sets, \$146,807.

Calwin Co., The, 1105 Truman Rd., Kansas City, Mo., production of a motion picture, 1 ea., script, 1 ea., release prints, 30 ea., \$98,604.

Camera Equipment Co., 1600 Broadway, N. Y., tripods and tripod parts, 30 ea., \$25,915.

Camfield Mfg. Co., 718 N. Seventh St., Grand Haven, Mich., antenna AT-234/APX, \$306,461.

Carb Mfg. Co., 25 Carroll St., Brooklyn, chair, side, armless, 4,327 ea., \$49,327; chairs, desks, settees, tables, \$287,253.

Carter Agent, Inc., S. C., Jr., 10 Bridge St., N. Y., resistors, colonial radio, 3,120 ea., \$32,448.

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Cut-away view of Edison Fire Detection Relay Panel, left, shows two SPEED NUT Connector Mounting Rings in position. "U" Type SPEED NUTS, self-retained on 4 corners of ring, line up with screws driven from outside panel. Detail drawing, below, is close-up of assembly.

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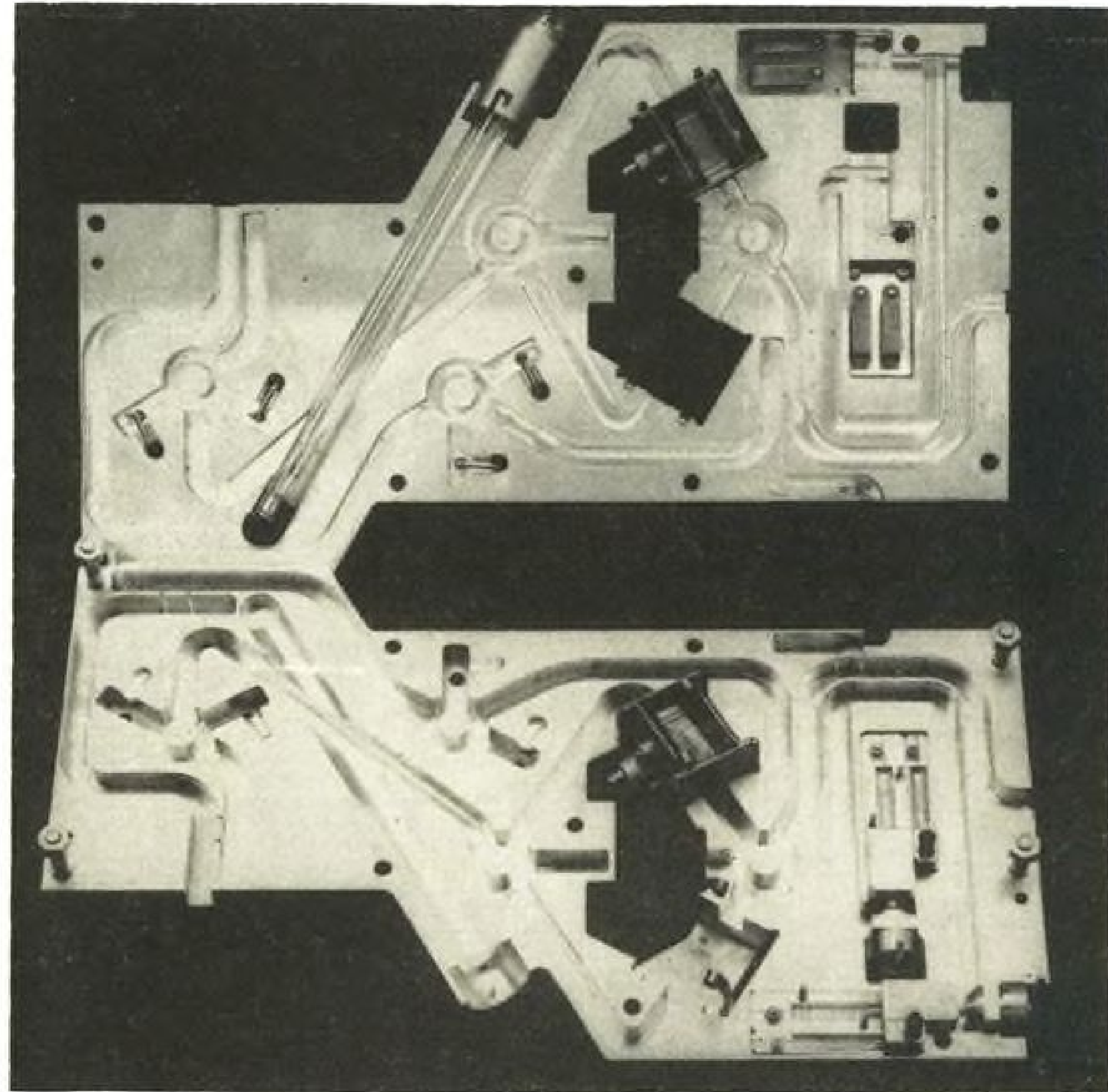


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AVIONICS



CIRCUITRY MILLED into solid blocks which are then folded together show how . . .

Radar Plumbing Can Be Lightened

Farranti cuts the size and weight of waveguides in half by technique of milling channels in blocks.

By Philip Klass

The size and weight of radar and microwave "plumbing" may be reduced by one-half or more with a new technique recently disclosed by Britain's Farranti, Ltd. Its application could ease space and weight problems brought on by the growing use of radar on military aircraft, particularly interceptors.

► **Milled Blocks**—Instead of using conventional waveguides to carry high-frequency radar energy, Farranti mills channels, half the width of the major dimension of the required waveguide, in two metal plates or blocks of suitable conductive material. The two halves are then joined and bolted together to form the rectangular waveguide circuits, including duplexers.

With the new technique, interconnecting plumbing can be folded at sharp angles to form a compact RF (radio frequency) assembly. If such bends were attempted in conventional waveguides,

they would distort waveguide wall thickness, damaging performance.

Since there is no current flow across the major axis of a waveguide, the division where the two halves of the Farranti blocks join has no adverse electrical effect, the company says.

► **Added Advantages**—In addition to its size and weight advantages, the Farranti milled-block technique also provides:

- **More rugged construction.** RF circuits are protected from inadvertent damage by maintenance personnel because of the enclosed block-type construction.

- **Easy inspection.** The two halves of the milled block can be quickly separated for visual inspection by removing retaining bolts. (Although Farranti doesn't say, American industry sources believe built-in dowel pins are provided to assure extremely accurate alignment of the two halves of the block.)

- **Component mounting.** Additional guideways can be milled into the block

to permit plug-in type mounting of TR and ATR switches, crystals, probes, the IF (intermediate frequency) amplifier, etc.

► **U. S. Investigates**—AVIATION WEEK has learned that at least two U. S. manufacturers are working on similar milled-block techniques under military contract.

A spokesman for one of these companies said that he thought the new milled-block technique held considerable promise for cutting size and weight of airborne radar. (He also spoke of the even greater size- and weight-saving possible with the printed circuit waveguide technique recently disclosed by Federal Telecommunications Laboratories.)

► **Manufacturing Time Cut**—Farranti says that its new technique cut manufacturing time to about one-third that required for a conventional waveguide assembly.

This figure sounded reasonable for smaller (higher-frequency) waveguides to the spokesman for one U. S. manufacturer. He warned that larger size milled-block waveguides might not stack up as favorably because of the added milling time required. One way out of this problem, he suggested, was to cast the blocks and use the milling operation to "clean them up and obtain final dimensions."

Overvoltage Cutoff Protects Alternators

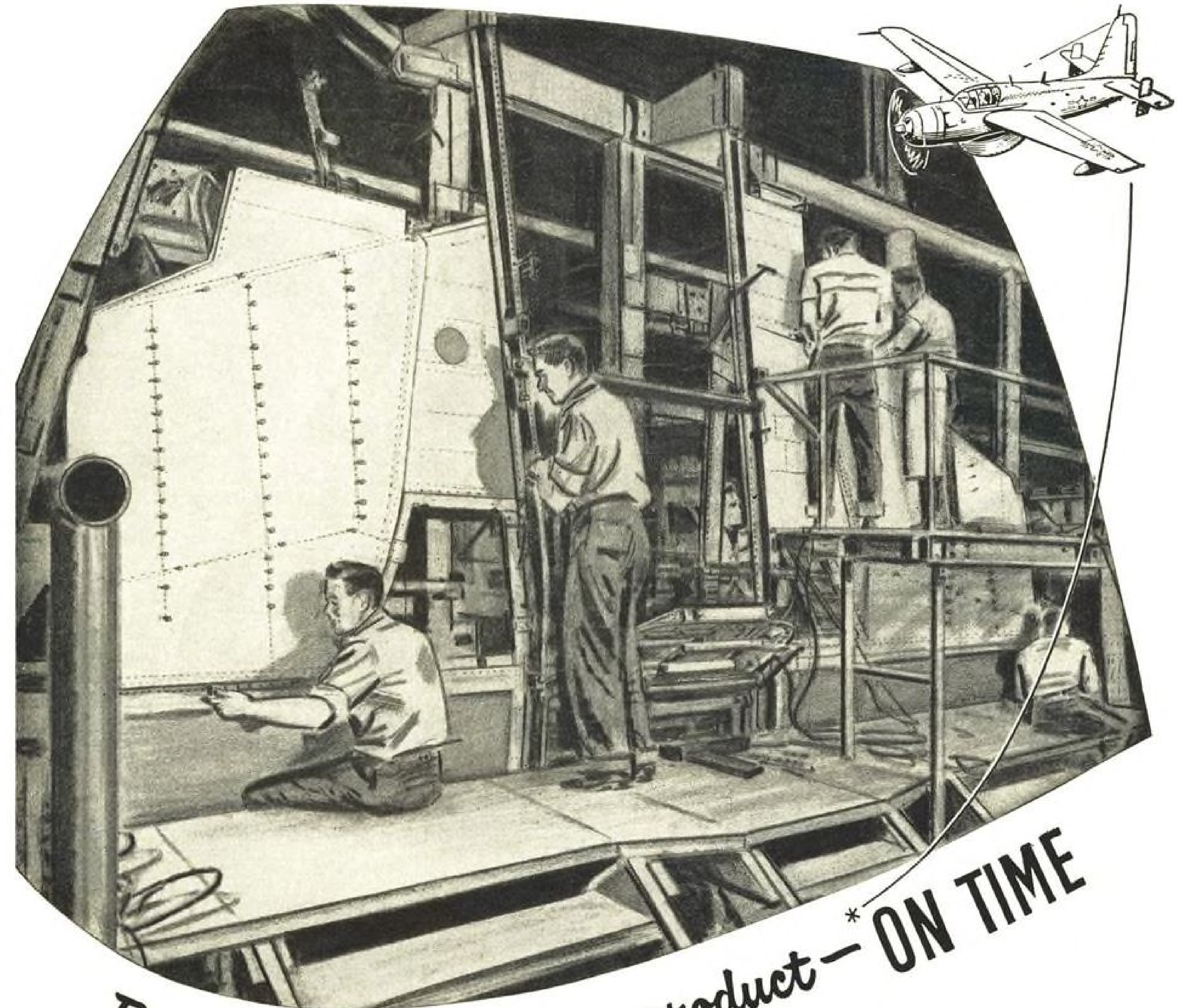
An a.c. current-sensing and cutoff system to protect aircraft alternators hooked up in parallel from reverse current and overvoltage has been developed by Gavco Corp. It can also be used for d.c. overvoltage protection.

Said to be one of the first of its type, this equipment, called a three-phase directional power relay, provides a more precise trigger point and is less sensitive to vibration than other d.c. equipment, Gavco says.

Heart of the equipment is a set of three ruggedized, miniature cold-cathode gas triode tubes—one for each phase of the three-phase current—to trigger the circuits to cut off reverse current or overvoltage.

The unit weighs 3 lb. and is 100% hermetically sealed, much of it by improved techniques of potting components in insulating casting resins. The equipment is designed not to trigger prematurely from a short pulse of overvoltage.

The set consists of four small boxes. Three of these are individual sensing units, one for each phase of current, in which are contained the trigger tubes and master relays. Current conditions in the main alternator circuits are telegraphed to these sensing units by three



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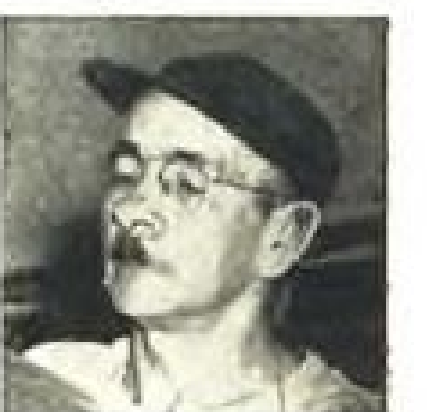
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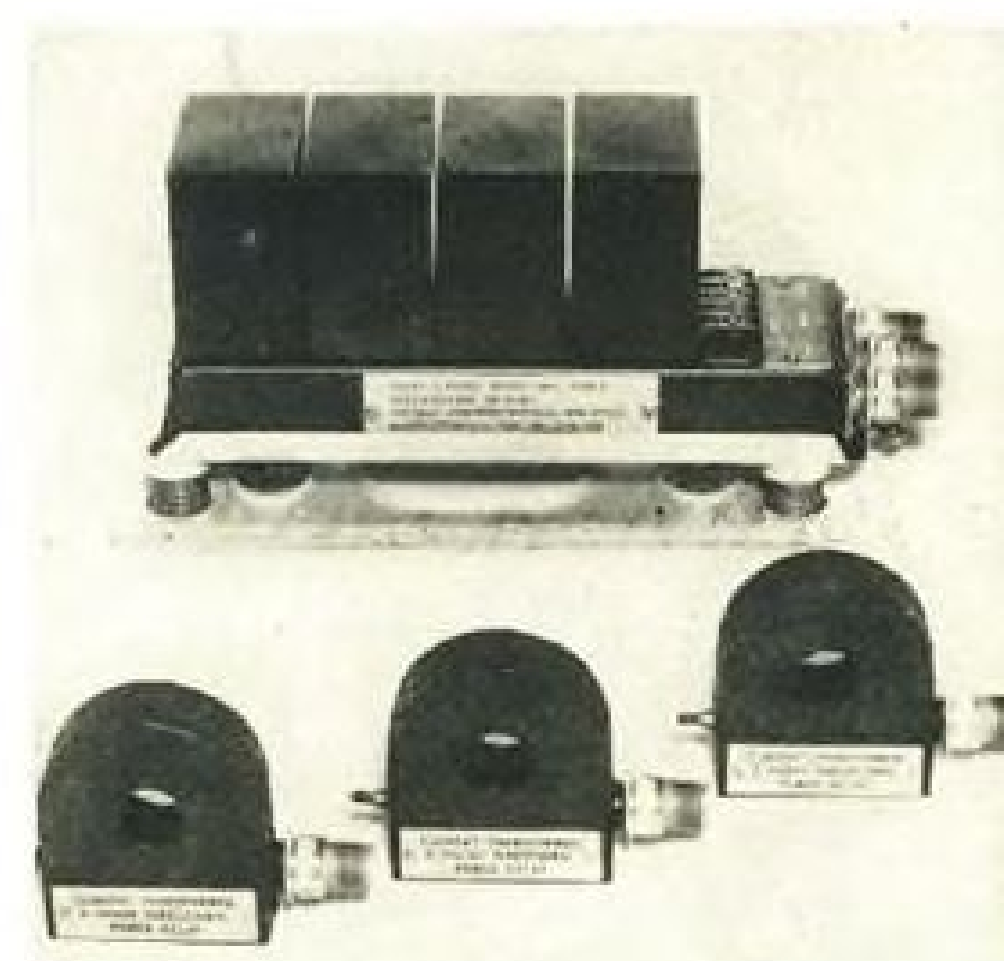
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The MB-3 adds safety and cuts the fatigue factor of instrument, "on top" and marginal weather flying. The MB-3 three-light marker gives accurate position fixes along radio ranges and ILS approaches by a distinctive colored light plus audible indication to identify the particular type of 75 mc marker facility the aircraft flies over. Because of its low weight and small size the MB-3 is rapidly going into service with personal, executive and airline aircraft. Complete specifications and illustrated features of the MB-3 may be had on request. Write for your copy and name of dealer nearest you — TODAY!

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Overvoltage Cutoff

doughnut-shaped current transformers which impress on the sensing circuits a voltage that is proportional to line current.

A reverse power flow of 2,000 watts or overvoltage in any phase will cause the master relay of the respective sensing unit to be triggered, which in turn operates a slave relay. The slave relay in turn shuts down the alternator.

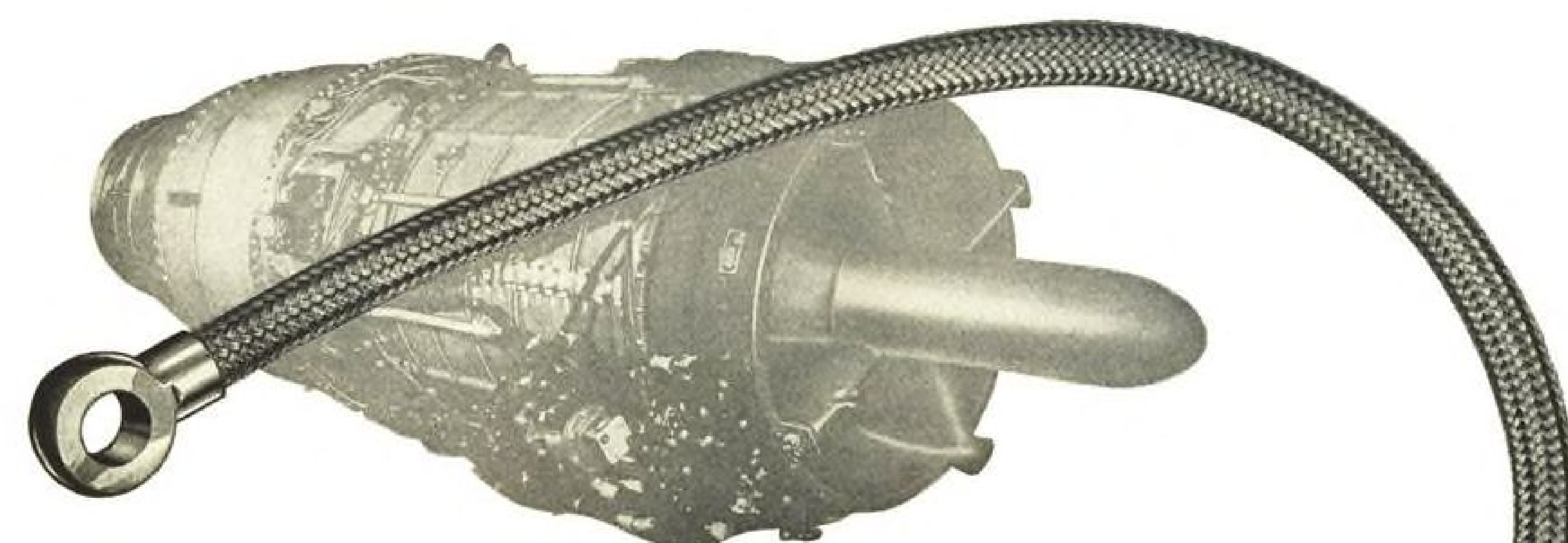
The set was developed originally for a power system using two 60-kva. 208/120-v., 4-wire, 400-c., three-phase. Navy-type E-1823 alternators remotely driven by air-turbine drives.

Caveco Corp., 540 E. 80 St., New York 21, N. Y.

FILTER CENTER

► New Collins Navigation Computer—American Airlines' chief pilots recently got a demonstration of Collins Radio's new theta-theta navigation computer. Device permits offset track flying and provides information on distance to destination, possibly easing the need for DME (distance measuring equipment). Computer can also provide distance-to-touchdown information during ILS approach. Device operates from dual VOR (omnirange) receivers and requires no added equipment.

► Intercept Radar Simulator—Radar operators for Navy's two-man interceptors, such as the Douglas F3D, will be trained in a new radar simulator to be built by Fairchild Engine & Airplane Co.'s Guided Missiles division. The device will be installed in an airplane flight simulator and will create a synthetic target on the operator's radar scope from which he will direct the pilot to fly an intercept course. Airplane simulator maneuvers will feed back into radar scope to change the target "blip" position on the scope. The devices will go to the Office of Naval Research.

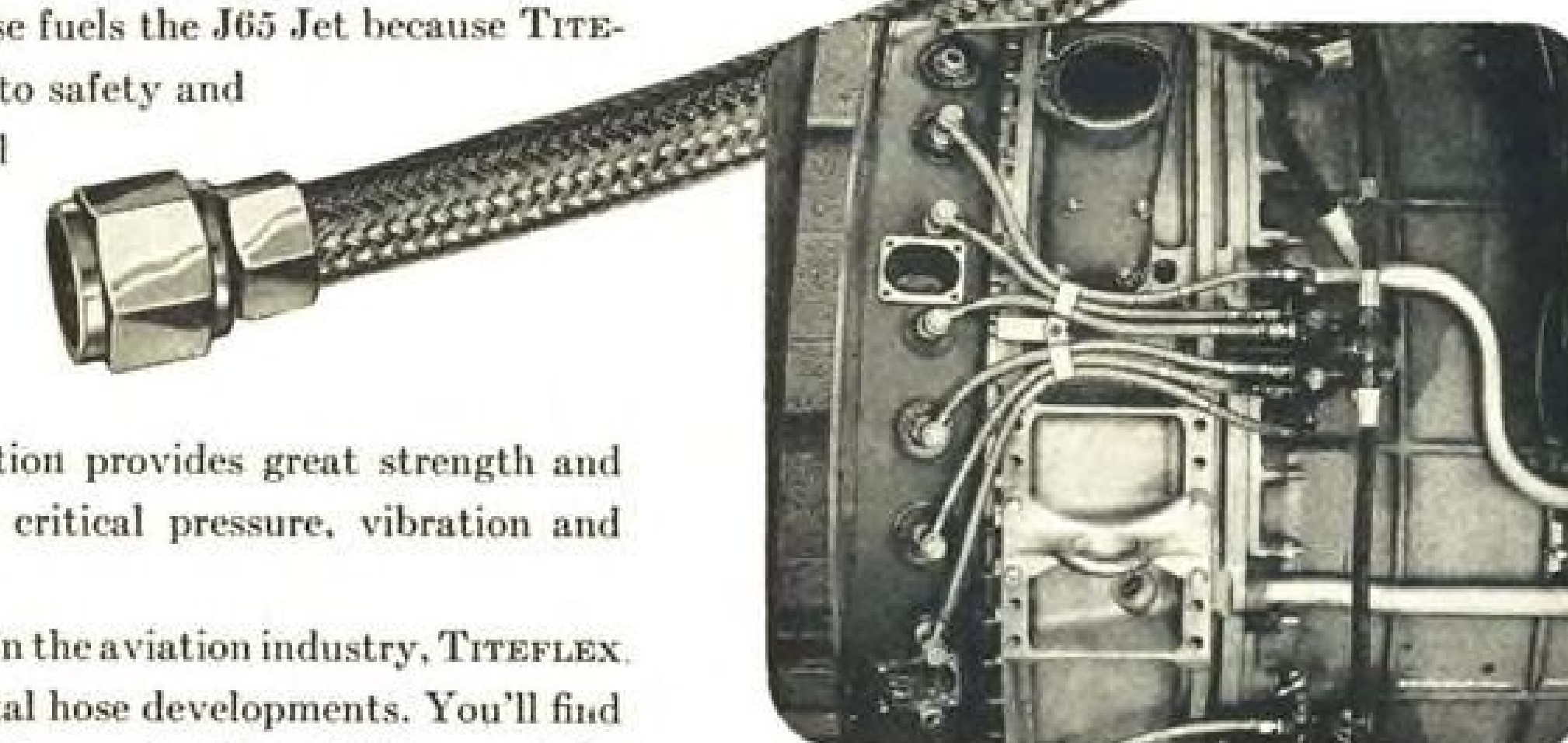


Flexible Metal Throat Feeds Fire in the Sapphire

Here's the new Wright J65 (Sapphire) Turbojet engine—and the TITEFLEX® metal hose throat through which it gets its fuel. Flow must be regular and unfailing and the fuel line must be leakproof.

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With years of outstanding service in the aviation industry, TITEFLEX today leads the aviation field in metal hose developments. You'll find TITEFLEX preferred for such applications as flexible shielding conduits and ignition harness; oil and fuel lines; flexible air, water and hydraulic connections. TITEFLEX Engineers and Designers have a vast knowledge of TITEFLEX performance and its unlimited possibilities. Original design work and problem-solving are important parts of our business. Let us help you solve your connection problems. Write for literature.



Close up of Titeflex fuel injection lines for the Wright J65. Tested for temperatures from —70°F to +600°F and for pressures up to 500 p.s.i.

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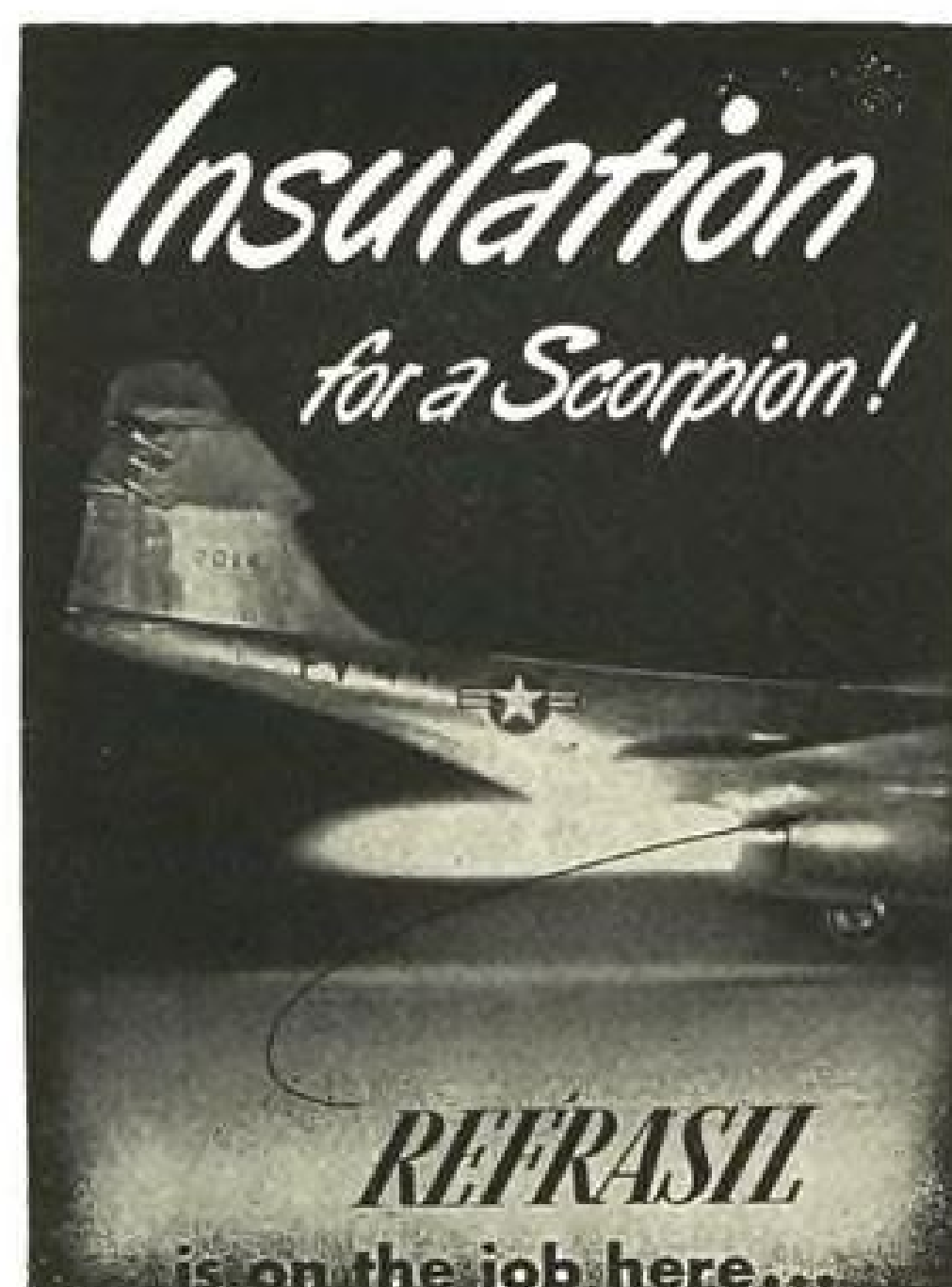
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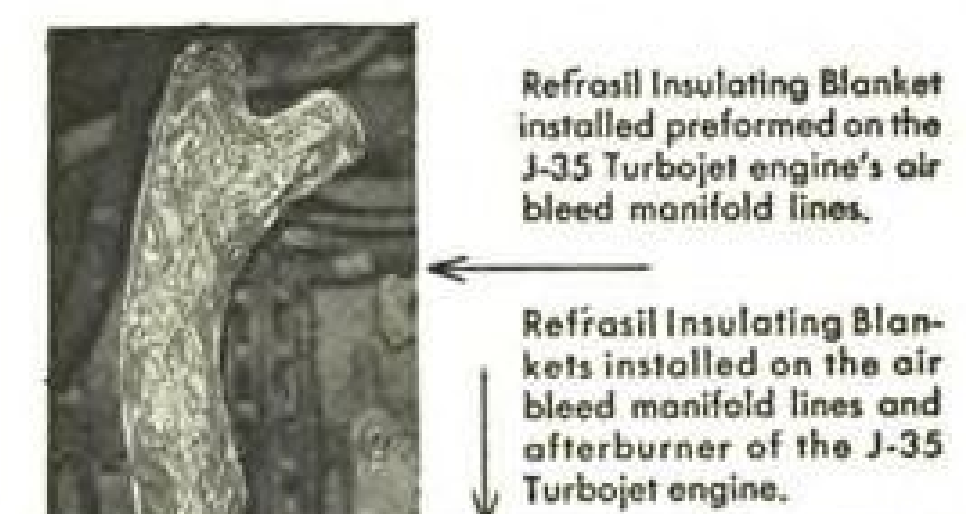
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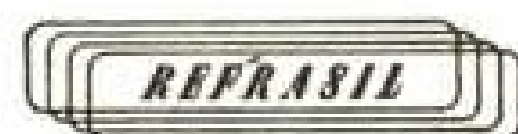
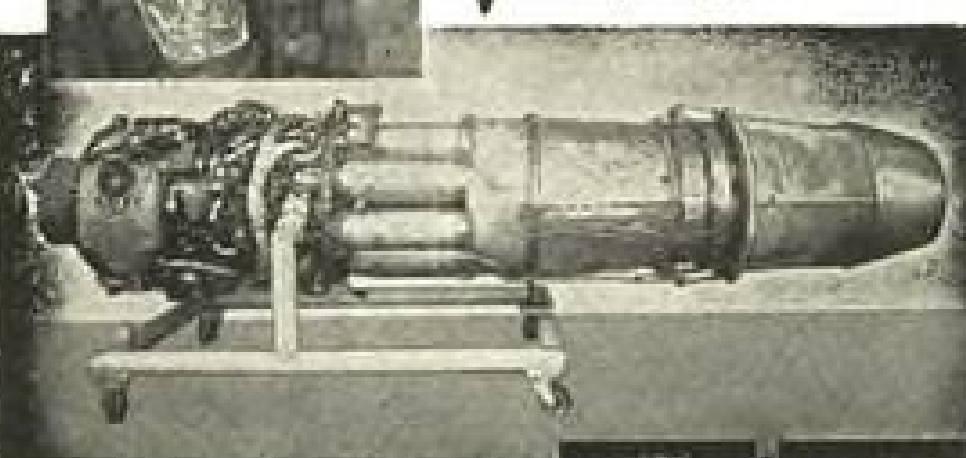


This bolt of flame from the afterburners of the U.S. Air Forces' Northrop Scorpion F-89 is spectacular evidence of the intense heat generated by jet power. Refrasil Blankets are used on the F-89's twin-engines because they are light in weight and are easily removable, as well as high in insulation efficiency. In a blanket thickness of one half inch, a temperature drop of approximately 900° F. is accomplished! These are reasons why Refrasil Lightweight Removable Insulation Blankets are specified by 90% of jet aircraft makers.

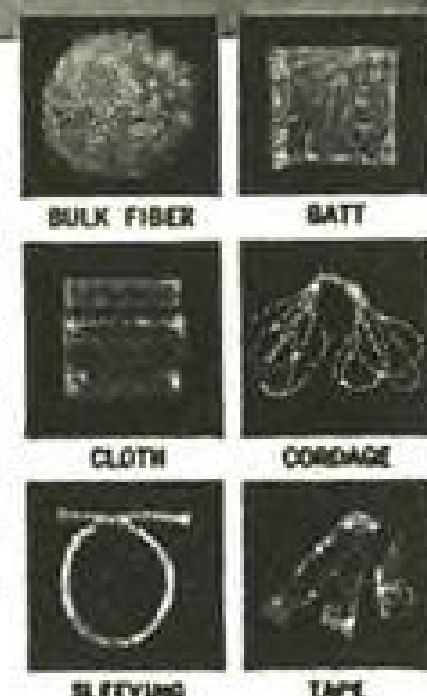


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FINANCIAL

GM Air Giant Stirring Again?

- Through North American Aviation and Bendix, auto firm once blanketed the aviation industry.
- Does consolidation now of Aeroproducts and Allison divisions foreshadow a new expansion?

Recent consolidation of General Motors' Aeroproducts and Allison divisions "to better serve the military services and aircraft manufacturers" (AVIATION WEEK Sept. 22, p. 18) recalls the dominant position the colossus of the automotive industry once enjoyed in aviation. And though the consolidation promises to start a new chapter of GM aviation participation, the auto giant is not likely ever again to approach its former eminence in this field.

Allison and Aeroproducts are the last remaining units in GM's once formidable investment in enterprises connected with aviation.

► **1929 Start**—General Motors made its initial entry into aviation in 1929. The automotive combine rather timidly remarked in its annual report at that time.

"What the future of the airplane may be, no one can positively state at this time. Through this association General Motors will be able to evaluate the development of the industry and determine its future policies with a more definite knowledge of the facts."

General Motors has done well in aviation—has made it pay. At all times, too, GM, by its aviation investments, has had a form of insurance, a hedge against other industrial developments supplanting its main function. And when it decided to leave the aircraft industry, the decision was made freely and not under the pressure of competitive factors.

In recent years GM's announced policy has been to dispose of investments in companies not wholly owned and somewhat removed from its main function. At least this was the explanation advanced when its minority interests in Bendix Aviation Corp. and North American Aviation were put on the block in 1948.

► **North American Aviation Born**—General Motors' most profitable aviation commitment developed through the initial acquisition of 400,000 shares in May 1929 of the Fokker Aircraft Corp. of America (name later changed

to General Aviation Corp.). At the end of 1929, General Motors valued its Fokker investment at \$7,782,342. Through other additions, consolidations, exchanges and simplifications, GM came up with the ownership of 1,015,061 shares, or 29.55%, of the newly emerged North American Aviation, Inc., as of Dec. 31, 1934.

GM's farflung aviation participation through its interest in North American Aviation, Inc., can be seen in the holdings of the latter company early in 1934. At the time, North American Aviation owned:

- 52% of the stock of Western Air Express Corp. Western owned all the issued stock of Western Air Express, Inc., and 47.6% of the stock of Transcontinental & Western Air, Inc.
- 27% of the stock of Transcontinental Air Transport, Inc., a holding company whose principal asset was 47.6% of the stock of Transcontinental & Western Air, Inc.
- 19% of the stock of Douglas Aircraft Co., Inc.
- 100% of the stock of Eastern Air Transport, Inc. (later to become Eastern Air Lines, Inc.).
- 100% of the stock of General Aviation Manufacturing Corp., which was engaged in building Army and Navy planes at the B-J plant at Dundalk, Md.

The stock interest in Douglas Aircraft Co., Inc., was sold at a profit of \$1,199,942.

► **Reorganizations**—Due to the terms of the Air Mail Act of 1934, a number of reorganization moves became necessary. North American received \$712,695 in cash and 198,384 shares of Transcontinental & Western Air, Inc., when it disposed of its Western Air Express Corp. holdings. An additional 81,160 shares of Transcontinental & Western Air, Inc., stock were received on the liquidation of Transcontinental Air Transport, Inc.

The 279,544 shares of Transcontinental & Western Air, Inc., which North American now owned, was distributed to the stockholders of the



Corsairs Join the French Navy

Glistening new Corsairs wearing the anchor and tri-color insignia of the French Navy are rolling off production lines at Chance Vought Aircraft in Dallas, Texas. They are F4U-7 Corsairs, now being built in quantity for the French Government under the Mutual Defense Assistance Program.

France is getting America's number one piston engined fighter-bomber in the F4U-7. It is similar to the F4U-4 Corsair, but, like the AU-1 Corsair currently in production for the U. S. Marine Corps, carries heavier armor and armament. Other Corsair models have flown thousands of vital missions in Korea.

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15 YEARS CONTINUOUS RESEARCH AND DEVELOPMENT ON PRESSURE FUELING SYSTEMS AND EQUIPMENT

latter company Feb. 15, 1938. General Motors Corp. received 81,204 shares, or 13.03%, and was in virtual control of Transcontinental & Western Air, Inc.

In the same year, General Motors sold this stock to Lehman Brothers and Atlas Corp. for an indicated price of about \$1,200,000.

► **EAL Sale**—Turning to manufacturing in preference to the air transport activities, General Motors got completely out of the transport field in 1938 when North American sold its Eastern Air Lines division for \$3.5 million to a syndicate headed by Capt. E. V. Rickenbacker. As a result, the development and manufacturing of military aircraft now became the sole activity of the company.

At the end of 1938, with the various dispositions completed by North American, General Motors owned 1,000,061 shares, or 29.11% of the total, which it carried on its books at \$4,510,611. From 1938 to mid-1948 when its North American stock was sold, GM received more than \$10 million in dividends alone from this source. In its sale of the North American shares, General Motors is estimated to have realized a capital gain of another \$10 million to augment its previous dividend income from this source.

General Motors also did very well in its one-time investment in Bendix Aviation Corp. In April 1929, 500,000 shares, or 23.84%, of Bendix were acquired for \$15 million in cash and other assets. Dividend income from this source together with the capital gains realized on the sale of the Bendix stock, with the final transaction early in 1948, gave General Motors a substantial profit in this commitment as well.

► **Allison Background**—All that remains of General Motors' once formidable aviation participation is the recently consolidated Aeroproducts-Allison division.

Like the Fokker and Bendix ventures, GM's Allison interest dates back to 1929. It was in that year that the corporation purchased Allison Engineering Co. whose facilities were, and still are, located alongside the Indianapolis Speedway. The unit became a wholly owned subsidiary engaged in selling activities. Total capitalization is carried at \$10,000.

The actual development and manufacture of the Allison engines have not been conducted by Allison Engineering Co. They have been under the wing of the Allison division of General Motors Corp., on which no detailed information is available. The magnitude of Allison's physical facilities and production capacity, however, are known to be very great.

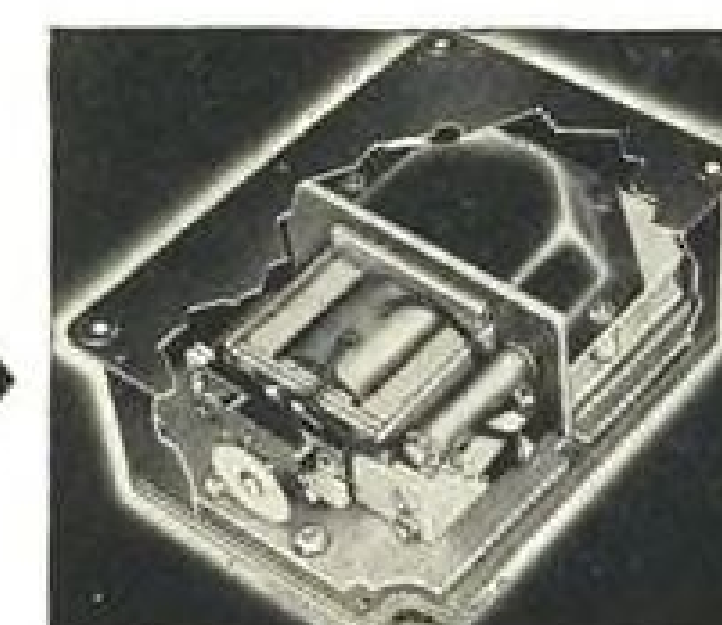
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EQUIPMENT

Hong Kong Aviation Trio Serves Orient

- HAEC's shop handles wide variety of work.
- Cathay Pacific, HKA routes cover the area.

By George L. Christian

Hong Kong—This city's aviation activities are dominated by a triumvirate consisting of an overhaul agency and two airlines—Hong Kong Aircraft Engineering Co., Ltd. (HAEC), Cathay Pacific Airways and Hong Kong Airways. Relations between the three are close—Cathay Pacific helped set up HAEC and now owns part of it; Hong Kong Airways' planes and crews are all chartered from CPA.

► **Overhaul Equipment**—HAEC maintains the most nearly complete overhaul facilities in this part of the world. It can handle engines such as the R1340, R1830, R2000, R2800 and a number of British engines; American and British propellers; automatic pilots, and airborne radar.

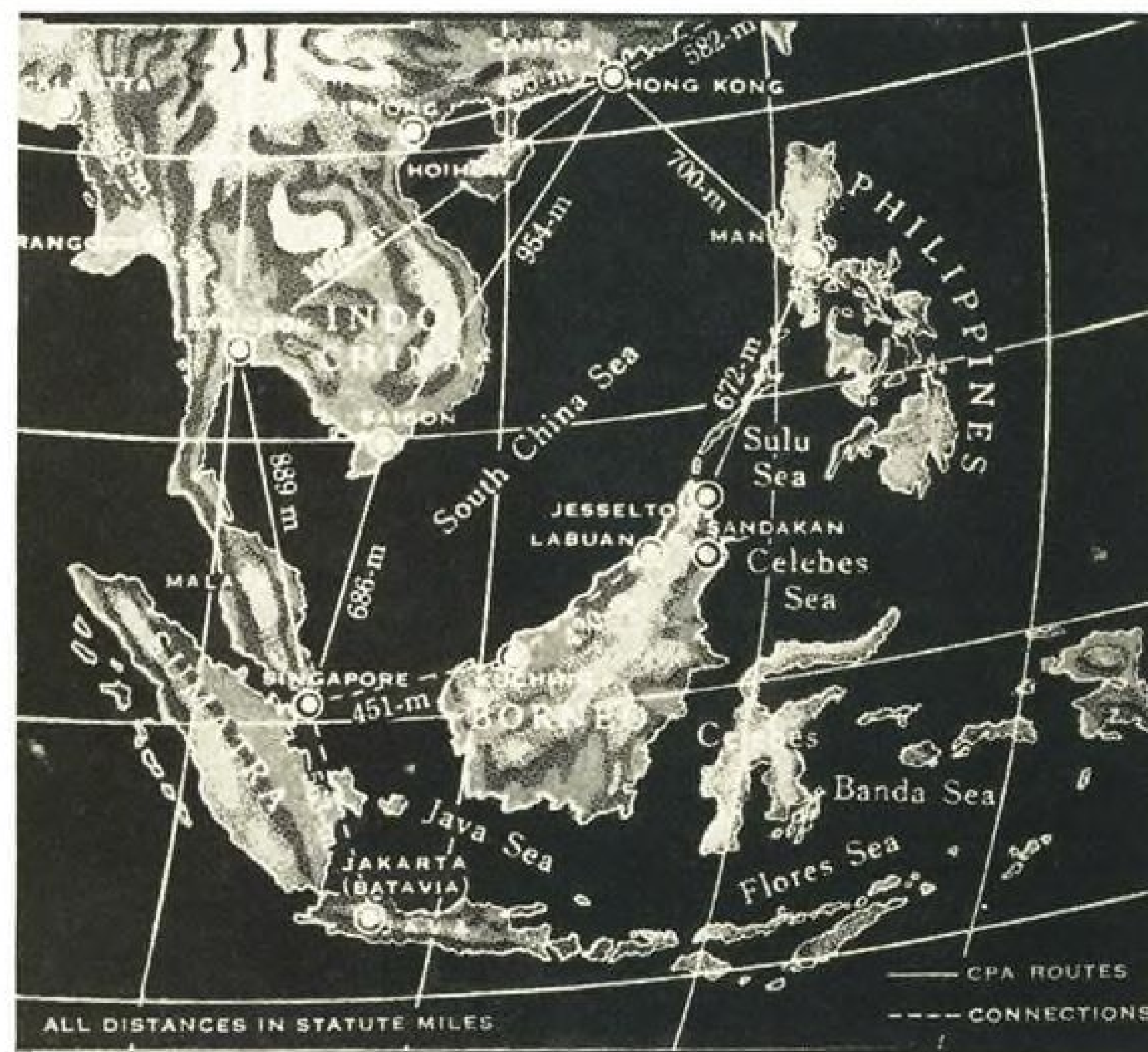
D. B. Lindsey, deputy general manager of HAEC, says that the nearest equivalent shop is 3,000 mi. away—Hindustan Aircraft, Ltd., at Bangalore, India.

► **Leased Engines**—Cathay Pacific Airways, part owner of HAEC, owns one DC-4 and two DC-3s, operates several schedules a week to such distant points as Singapore, Saigon, Manila, Sandakan (Borneo) and Haiphong (French Indo China), but does not now own the engines on its DC-4. The four engines on the aircraft, plus one spare, are being leased from Australian National Airways while the aircraft's original engines are modified.

In spite of such unpredictable occurrences, sudden changes of government regulations, leasing aircraft to a semi-competitor, operating under the noses of Communist Chinese, flying in areas where navigation aids are few and weather treacherous, Cathay Pacific has managed to break even on the books.

High operating expenses and difficulty in obtaining spare parts from the U. S. do give the airline trouble, though.

Hong Kong's airport, Kai Tak, has a hair-raising, mountain-dodging final approach circuit with its nearest alternate at Tainan, Formosa, two hours away as the DC-3 flies.



CATHAY PACIFIC AIRWAYS radiates into the South Orient from Hong Kong.



HAEC MAINTENANCE shop handles variety of jobs, including Spitfires and C-47s.

Hong Kong Airways owns no aircraft and hires no crews. Yet it operates regularly between Hong Kong and Formosa with its chartered CPA aircraft and crews.

► **Cosmopolitan Character**—HAEC's business reflects Hong Kong's cosmopolitan character. Among its customers are Civil Air Transport of Formosa, for whom Hong Kong Aircraft has over-

hauled some 300 R2800 engines, and another R2800 customer, the French Air Force, some of whose F4U engines pass through the shops.

HAEC's radio shop checks British Overseas Airways Corp.'s airborne radar, and works on Pan American World Airways' radio gear.

Complete maintenance facilities are furnished for Cathay Pacific Airways.

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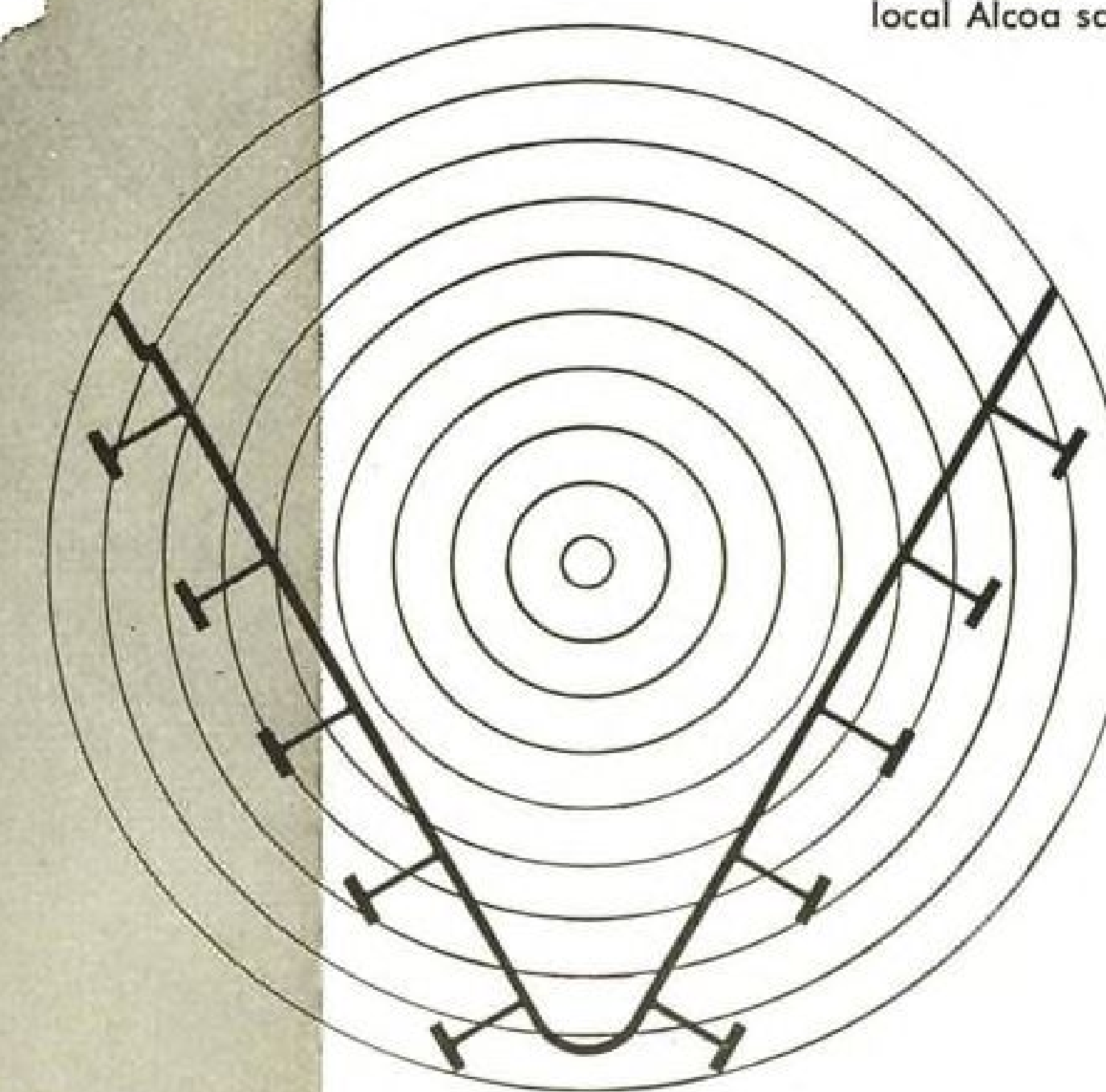
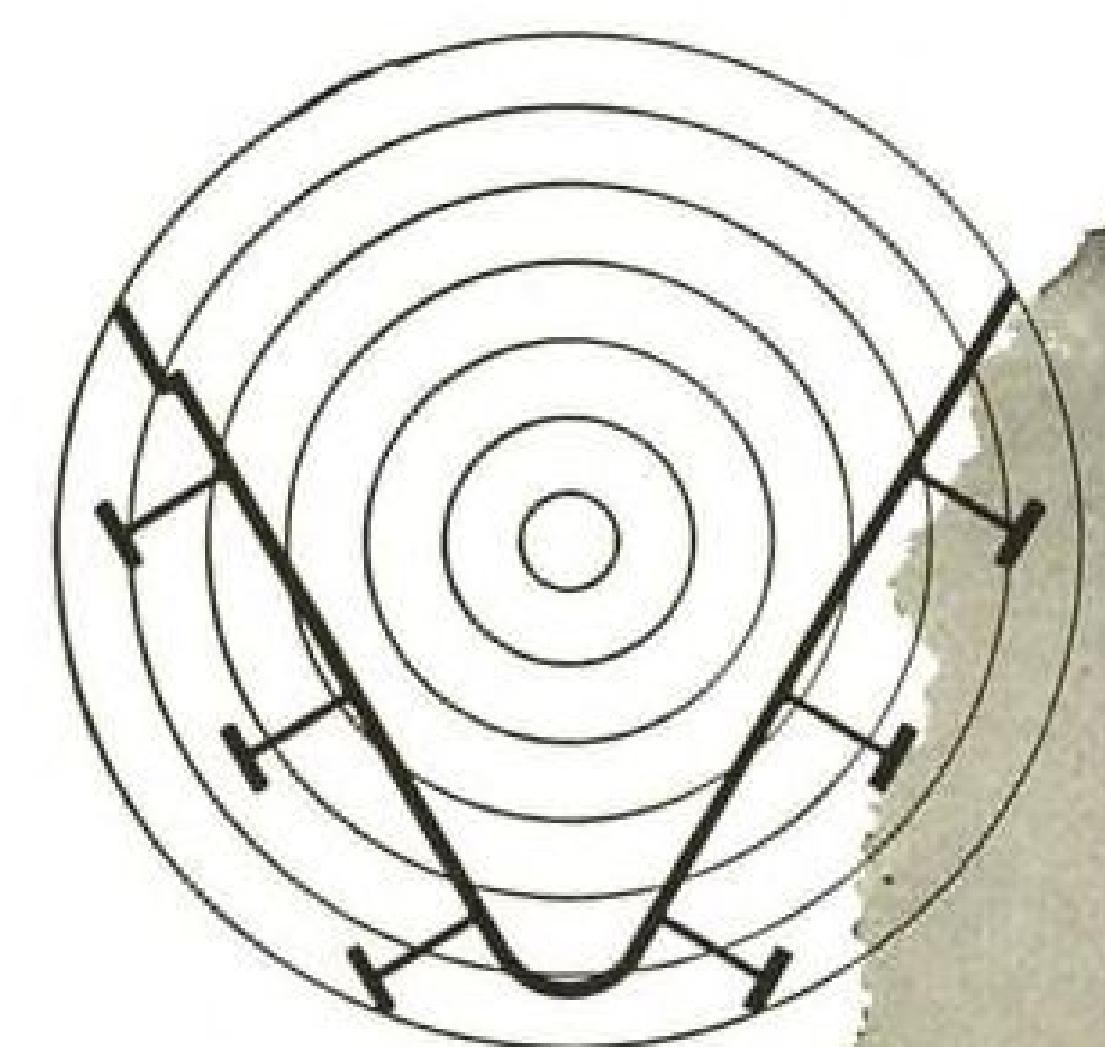
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Several airlines of French Indonesia patronize HAEC for overhaul, among them Aigle Azur, Compagnie Aérienne de Transports Indochinois, Air Vietnam and COSARA (Société des Transports Aériens de l'Extrême Orient).

► **Airline Maintenance**—Each of the 14 airlines serving Kai Tak calls on HAEC for some sort of work, the overhaul company says. The facility is prepared to carry out work in accordance with the regulations under which the customers' aircraft operate.

Operators may supply their own spares if desired. If they supply their own tools, these are reserved for their own exclusive use.

HAEC points out that it is geared to work 24 hours a day and that its staff, chosen from all parts of the world, holds a wide range of licenses. The firm's overhaul experience includes Spitfires, DC-3s, DC-4s, C-46s, PBYS and Norsemen.

HAEC was formed from two predecessors, Pacific Air Maintenance & Supply Co. and Jardine Aircraft Maintenance Co. The former was set up by Cathay Pacific Airways, the latter by Jardine, Matheson & Co. with BOAC, to overhaul Hong Kong Airways' planes, before HKA sold its fleet.

The engineering staff includes old timers from the Great Britain, the U. S. and Australia.

► **Radio & Radar**—Hong Kong Aircraft's radio shop is equipped with a complete range of testing and calibration equipment.

Its power supply is interesting. The output of generators being run in on generator test stands in the electrical shop is used to charge large, very-heavy-duty 120-amp. hr. wet cells, which in turn supply power requirements of the radio shop. This eliminates waste of generator output and does away with need for special power source.

Other uses of generator test stand output:

- Operates magneto magnetizer, eliminating purchase of hard-to-get rectifier tubes.
- Supplies current to the starter test stand.
- Powers test stand for Curtiss electric propellers in the prop shop.
- **Waterproof Harness**—Hong Kong Aircraft engineers have developed a method of waterproofing engine harnesses which is so good, they say, that almost every operator in the area (and the RAF) is turning to it.

Method is simple: Titeflex ignition harness is covered with an Australian-made plastic tubing called Nylex; one-inch Nylex sleeves are fitted over each end of the lead to assure water tightness.

The method gives excellent results in an area where waterproofing is a

The diagram illustrates the Beckman EASE Computer system for aircraft stability control. It features a stylized orange aircraft in the background. Key components and their connections are as follows:

- Pilot Inputs:** A box on the left contains three inputs: **PEDAL**, **STICK**, and **PEDAL**. The **STICK** input is connected to the **AILERON** control surface on the aircraft's wing.
- Control Surfaces:** The aircraft's **AILERON** and **RUDDER** are shown. The **AILERON** is labeled with $e_1 \propto \delta a$, and the **RUDDER** is labeled with $e_2 \propto \delta r$.
- Feedback and Control Loop:**
 - Inputs δa and δr (representing aileron and rudder deflection about trim) are fed into the computer system.
 - The computer system consists of two main racks of electronic components.
 - Outputs from the computer are sent to a **400~ CHOPPER** and a **YAW DAMPER**.
 - The **YAW DAMPER** is connected to the **RUDDER**.
 - A feedback loop with gain k connects the **YAW DAMPER** back to the computer system.
 - Intermediate variables are shown in boxes: ψ (yaw), $\dot{\psi}$ (rate of yaw), ϕ (roll), $\dot{\phi}$ (rate of roll), and β (sideslip).
- Legend:**
 - δa = aileron deflection about trim
 - δr = rudder deflection about trim
 - ψ = yaw
 - $\dot{\psi}$ = rate of yaw
 - ϕ = roll
 - $\dot{\phi}$ = rate of roll
 - β = sideslip
 - k = roll coupling constant

To minimize the high costs of designing controls through actual flight tests, North American Aviation now employs certain units of the Beckman EASE Computer to pre-test designs while still on the board.

A Typical Problem . . . To develop an automatic stability system that would eliminate yaw or side-skidding oscillation in

To minimize the high costs of designing controls through actual flight tests, North American Aviation now employs certain units of the Beckman EASE Computer to pre-test designs *while still on the board*.

A Typical Problem . . . To develop an automatic stability system that would eliminate yaw or side-skidding oscillation in piloting the F86-D Sabre Jet over a wide range of speeds and at altitudes from sea level to the stratosphere.

How North American Solved It... The diagram above shows how North American used certain units of the Beckman EASE Computer to quickly solve the problem by flight simulation. A control-system mockup was designed by engineers at North American which generated voltages proportional to aileron and rudder deflections made by movement of mockup stick and pedals. These voltages were fed into the computer so that its electrical response was analogous to the response of the F86-D in flight. Flight conditions—speed and altitude—were varied on the computer by merely turning knobs.

Airborne performance confirmed the results as developed by flight simulation!

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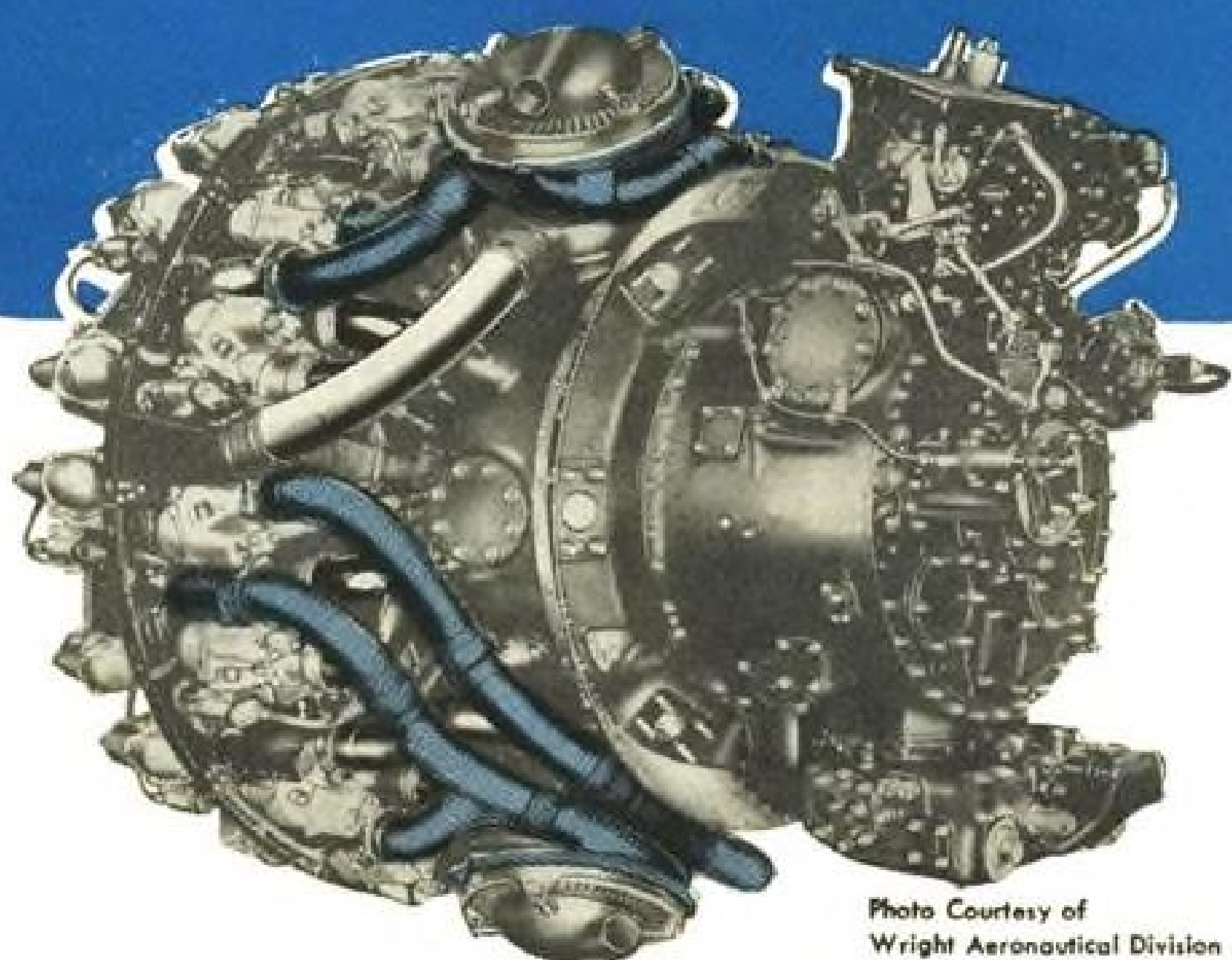


Photo Courtesy of
Wright Aeronautical Division

The old saying "A chain is no stronger than its weakest link" might easily be the axiom of aircraft design. No unit of the compound reciprocating engine is more significant for its efficient service than the lowly exhaust pipe.

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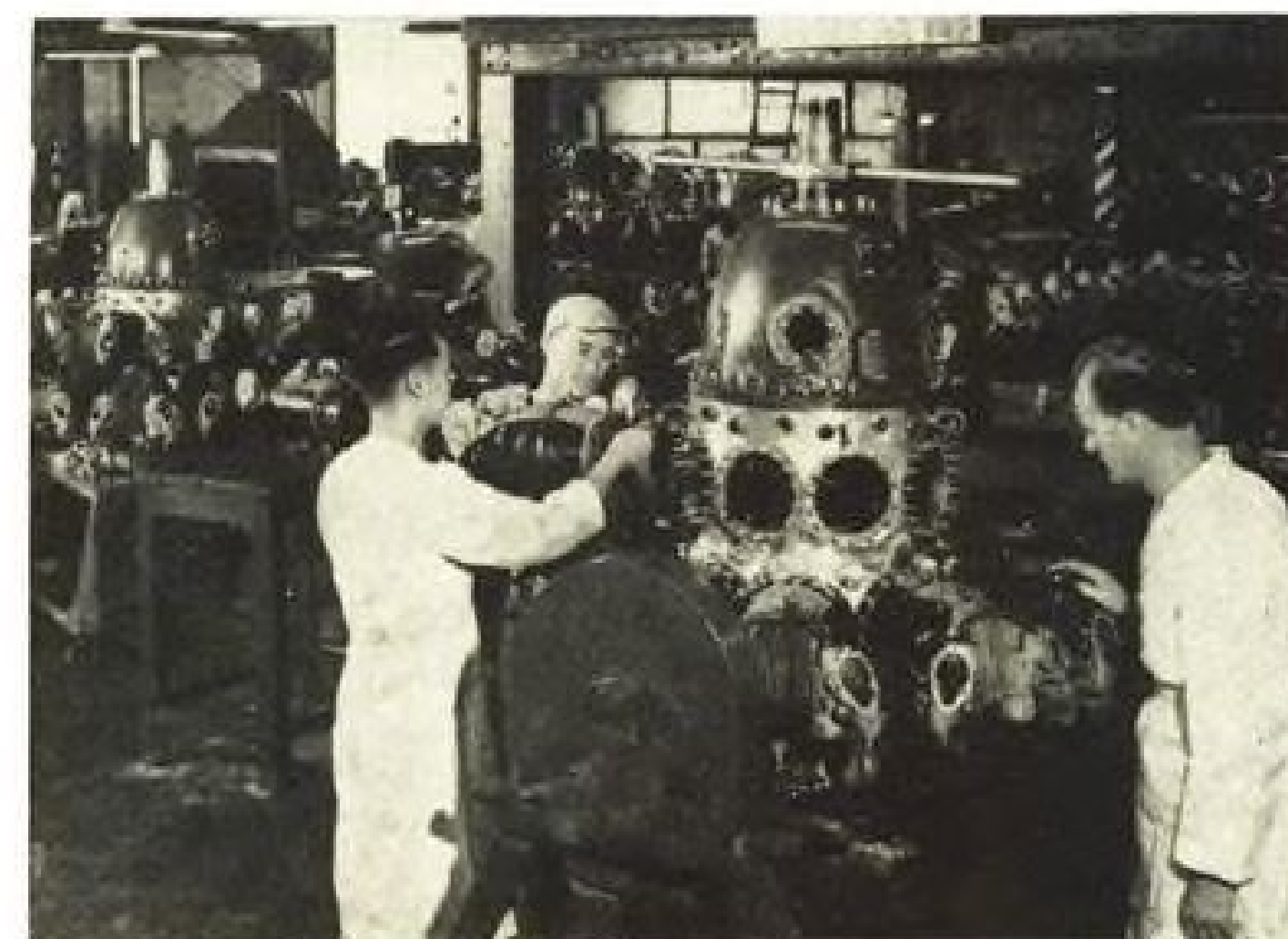
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BOAC ARGONAUT (above) being checked at Kai Tak Airport, Hong Kong, and Pratt & Whitney Aircraft R2800 piston engine (left) being overhauled in Hong Kong Aircraft Engineering Co.'s engine shop, typify work being done by HAEC.

necessity—it can rain 35 inches a month in Hong Kong.

► **Instrument Shop**—Unhurried patience of the Chinese makes them the best instrument men in the world, say HAEC spokesmen. The painstaking attention to detail the men give even the most minute part of their job results in finished products of the highest quality, HAEC says.

The workmen's skill is matched with a complement of modern equipment in an air conditioned shop. Among test machines are a Strobodine Gyro Balancer, stroboscopic tachometer, and a Scorsby table for checking gyroscopic equipment. All instruments overhauled in the shop are supplied with overhaul certificates. They are sealed in cellophane to withstand the extreme climatic conditions encountered in the South Orient.

► **Supplies**—A 24,000-sq. ft. storage building provides space for storing airframe, engine and accessory parts. Commercial components are binned separately. Special areas are partitioned to house customers' spares, which are handled on their own forms and in accordance with their own procedures. The floor space is subdivided to meet the requirements of the Director of Civil Aviation, Hong Kong.

► **Cathay Pacific Airways**—CPA's tap roots stem from an adventuresome duo, Roy Farrell, an American, and S. H. de Kantzow, an Australian. In February 1946, they bought two Dakotas (C-47s) with a group of ex-pilots. They hauled merchandise—mostly from Australia to

Shanghai, where it was sold for their own account.

The balance sheet soon showed black ink and passenger flights were sandwiched between freight runs. This service also proved popular. So, in September 1946, Cathay Pacific Airways was formed and registered in Hong Kong to care for the aircraft. Management was under de Kantzow.

W.C.G. Knowles, CPA's managing director pointed out to AVIATION WEEK: "In the early days after the war, there was a great shortage of all forms of transport in the Far East, and anybody who could help supply this deficiency was welcomed by the various governments concerned."

Strict government control of airline franchises began in 1947-48. CPA officials soon found out that their efforts to obtain operating rights from the Hong Kong government were hampered by the fact that CPA capital was predominantly American.

The U.S. shareholdings were eventually shifted to Butterfield & Swire, steamship agents and operators, and Australian National Airways. A new firm was formed in Hong Kong in October 1948, but it retained the name Cathay Pacific Airways. De Kantzow retained the managership and the old partners kept a small holding in the company.

Two and a half years later, de Kantzow and the old partners turned over their control and shares to Butterfield & Swire.

► **Equipment**—The airline's equipment



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picture grew from the two original C-47s to seven of the aircraft plus two Catalinas. Operations spread for a while to the interior of Burma, only to come to a halt when internal airlines in that country were nationalized. CPA disposed of the surplus aircraft, but bought a DC-4 in late 1949, bringing it to its present fleet of two DC-3s and one DC-4.

The DC-4's R2000-7 engines proved unsatisfactory. While awaiting their conversion, CPA leased five -13s from ANA. These engines gave an excellent account of themselves, causing only one serious delay (3½ hr.) in ten months, during which they operated 2,600 flying hours under the most rugged conditions, according to Knowles. Cathay Pacific expects soon to re-install its own engines in the DC-4.

► **Mysterious Orient**—Cathay Pacific had one of its planes commandeered by pirates, probably the only airline ever to suffer such an indignity.

Facts, as far as they are known, are these: A group of pirates boarded a Catalina bound from Macao to Hong Kong. The men they wanted to hold for ransom also got on. After the Cat became airborne, the pirates evidently tried to force the crew at gun point to change course to the pirates' destination. The crew apparently misjudged the pirates' determination. The plane wreckage was finally located—full of bullet holes. Sole survivor: one pirate.

► **Simplified Procedure**—A flight from Hong Kong to Taipeh, Formosa, in one of CPA's DC-3s (in this case under lease to Hong Kong Airways) showed this reporter how the company had simplified some of its procedures.

A large bin directly ahead of the main cabin loading door receives all passenger baggage. The airline must have sacrificed two or four seats, but the



COLD BLAST

Service for the service man is provided by this cooler (left) which can be rolled up to aircraft to bring down temperature in fuselage or working vicinity with air blast—from 114F to 82F at Luke AFB in Phoenix, Ariz. It was developed by Palmer Mfg. Co. of that city to speed maintenance on jet aircraft.

AVIATION WEEK, October 27, 1952

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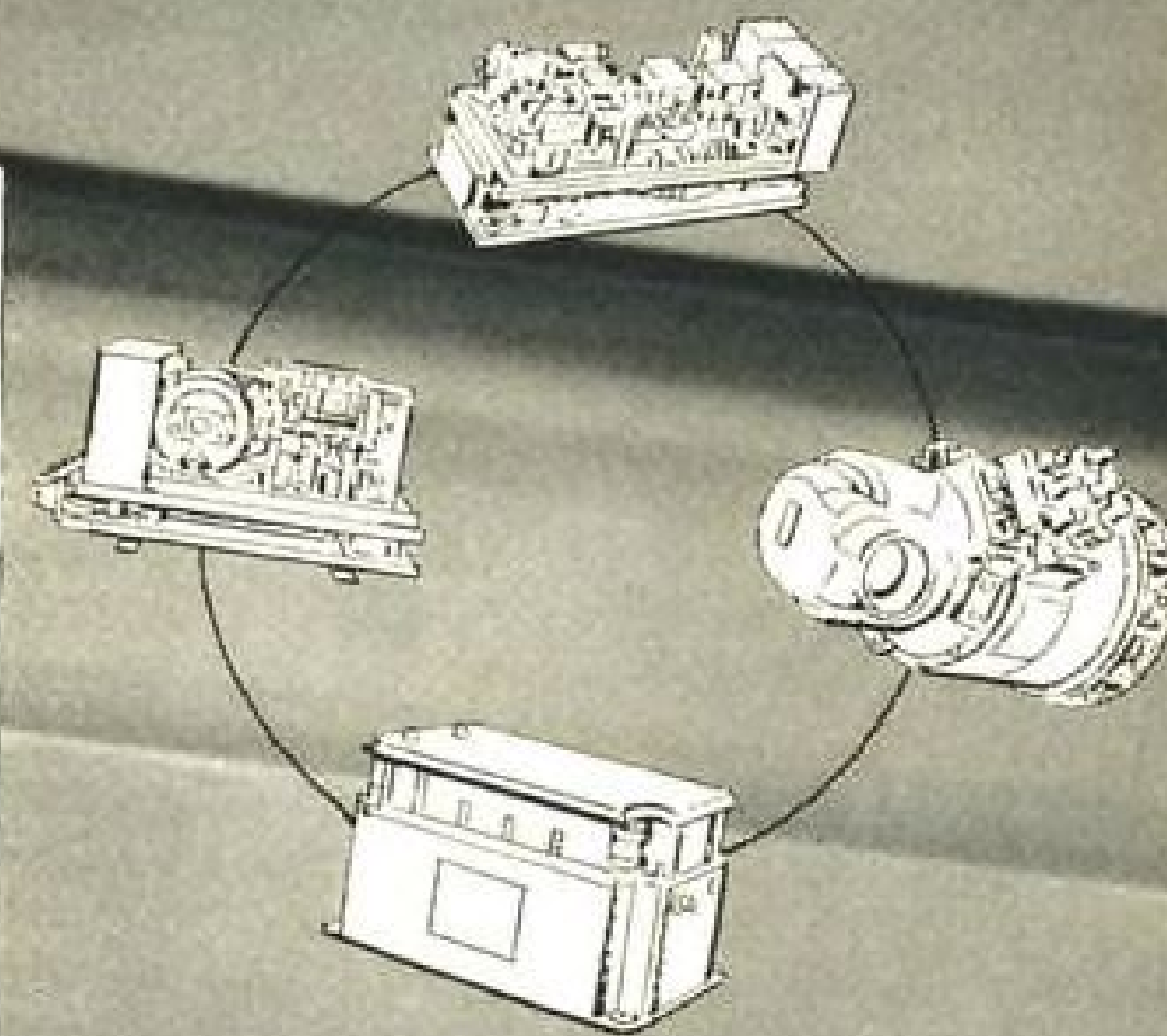
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Imagine an electrical system where circuits are next to a tank car of gasoline! Where temperatures range from 160 degrees to minus 67 degrees F and change rapidly. Where the whole system is subject to vibrational stresses. Finally, add routine functions of accommodating sudden load changes, system surges, and of meeting switching requirements. These are the severe problems that Westinghouse designers of modern aircraft power systems have had to overcome.

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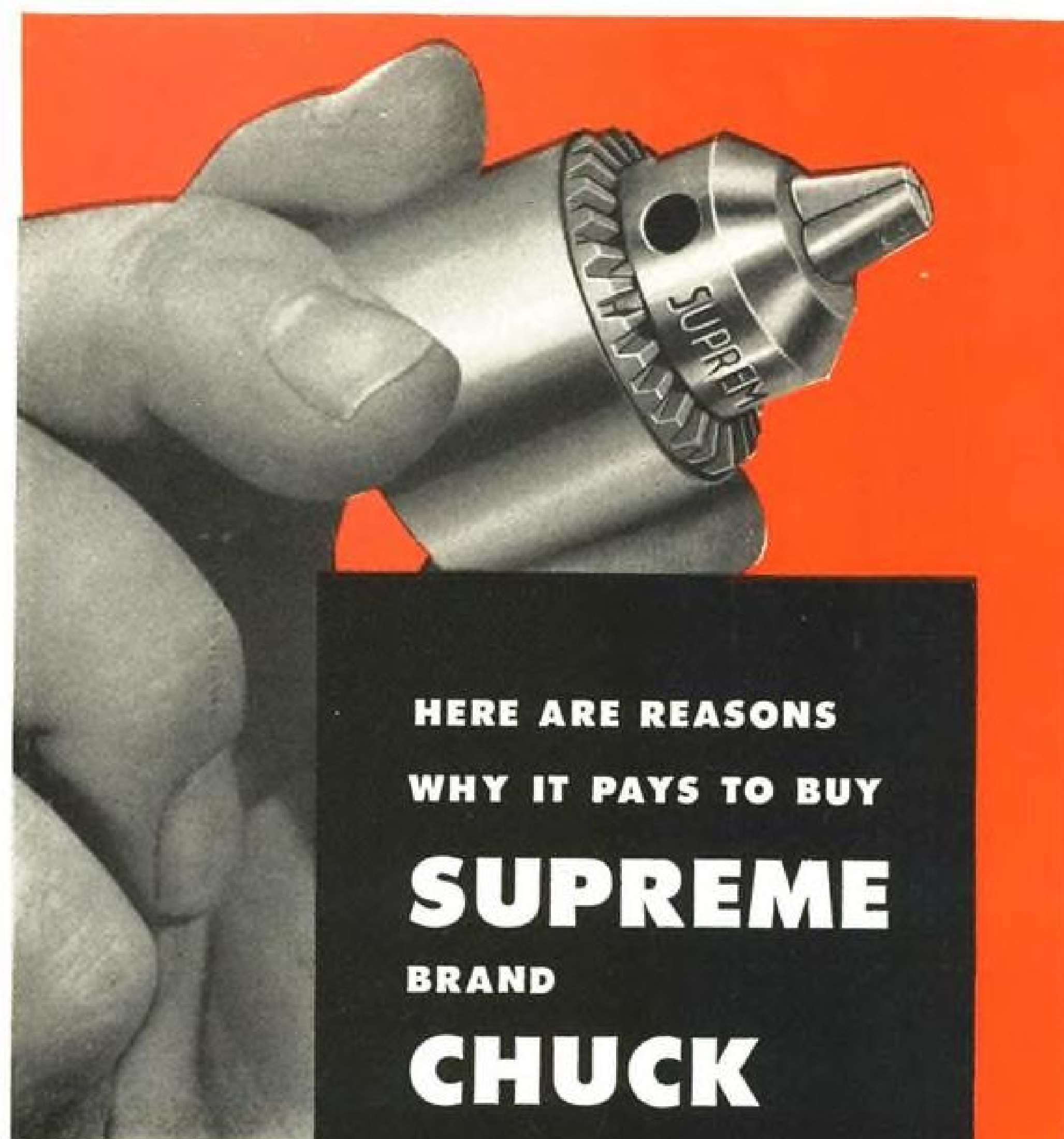
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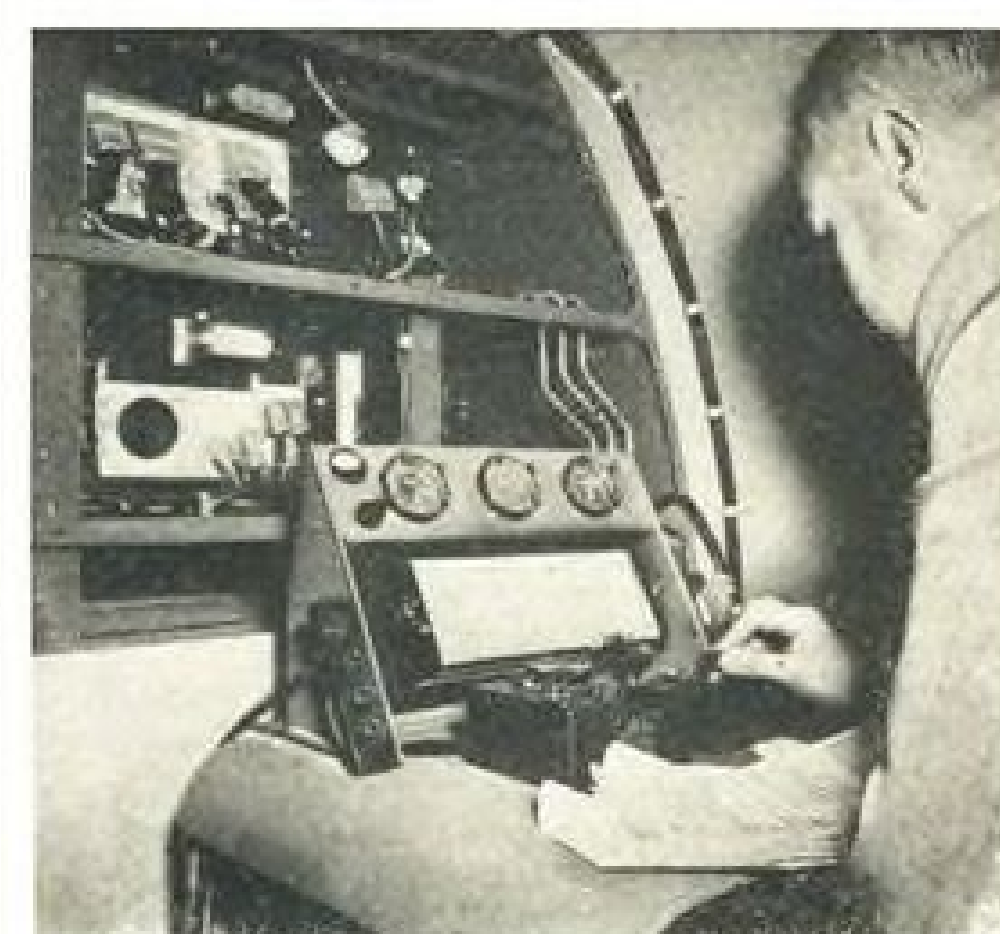
convenience of the carry-on carry-off luggage idea is something that U.S. carriers have come to recognize in such modern aircraft as the Convair-Liners and Martin 4-0-4s. Interior provides accommodations for only 16 passengers. So ample room is provided between the first row of seats and forward bulkhead for cargo.

The Australian crew of three (pilot, co-pilot and radio operator) got the plane off almost exactly on time and handled the 582-mi. all-overwater flight with dispatch. Although every flight to and from Taipei passes close to Red China Territory, no incidents have occurred to date.

OFF THE LINE

United Air Lines blocks out several pairs of seats upon origination of a flight. A sign hanging on a cord cutting out the seats reads "These seats reserved for passengers traveling together." UAL stewardesses say system is quite effective and saves them many a headache when couples are among the last to board a plane and cannot find seats together—especially if the two are honeymooning.

Honolulu—Here is a passenger phenomenon observed in Hawaii: Eight minutes before the departure of a Hawaiian Airlines DC-3 not a single passenger was present at the airport. All 20 of them arrived during the five minutes before scheduled departure time. These last-minute arrivals do not cause confusion and delays, HAL spokesmen say. Both they and the passengers are used to it.



DECCA LOG

Viscount's route is pinpointed by British Decca Navigator's pictorial presentation during flight tests of the turboprop airliner, one of a series scheduled before the Vickers Viscount 700 goes into service with British European Airways next year. Deccas, counterpart of U. S. omnirange and distance measuring equipment, are going into many of Britain's latest craft, although omnirange was picked as ICAO's standard.

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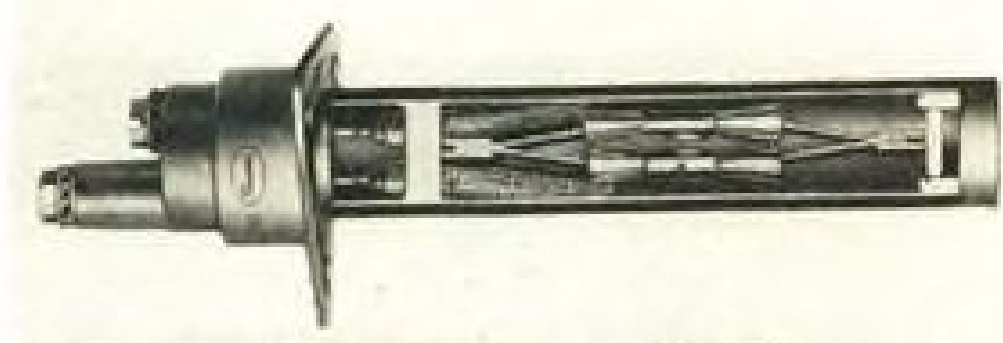
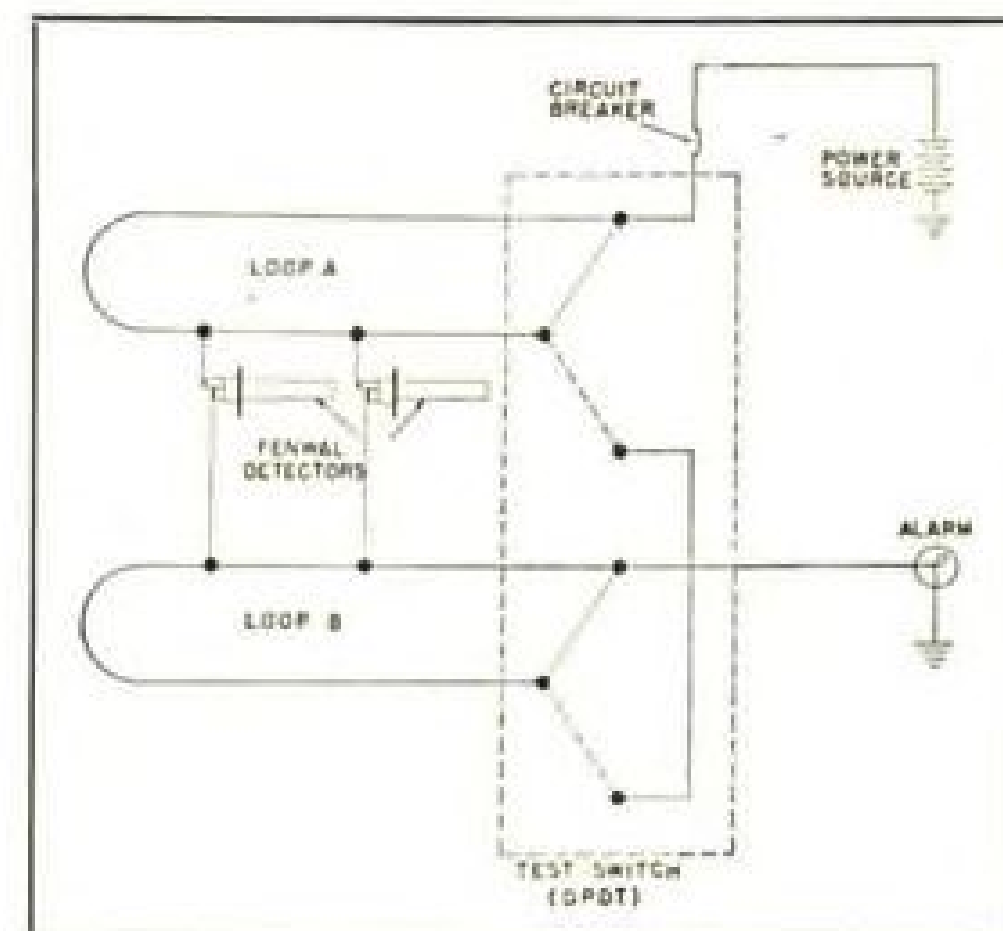
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EAL Super Connies Use Fenwal Fire Units

A new engine nacelle fire and over-heat warning system, used in Eastern Air Lines' Super Constellations, has several improved features, its maker, Fenwal, Inc., claims.

The system is less apt to ground out and give false alarms than previous types produced by the firm; and even if there should be breaks in the circuit, it is harder to knock out of operation, Fenwal says. The improvements can be attributed mainly to a new circuit arrangement, rather than to the fire detector elements, which remain essentially the same.

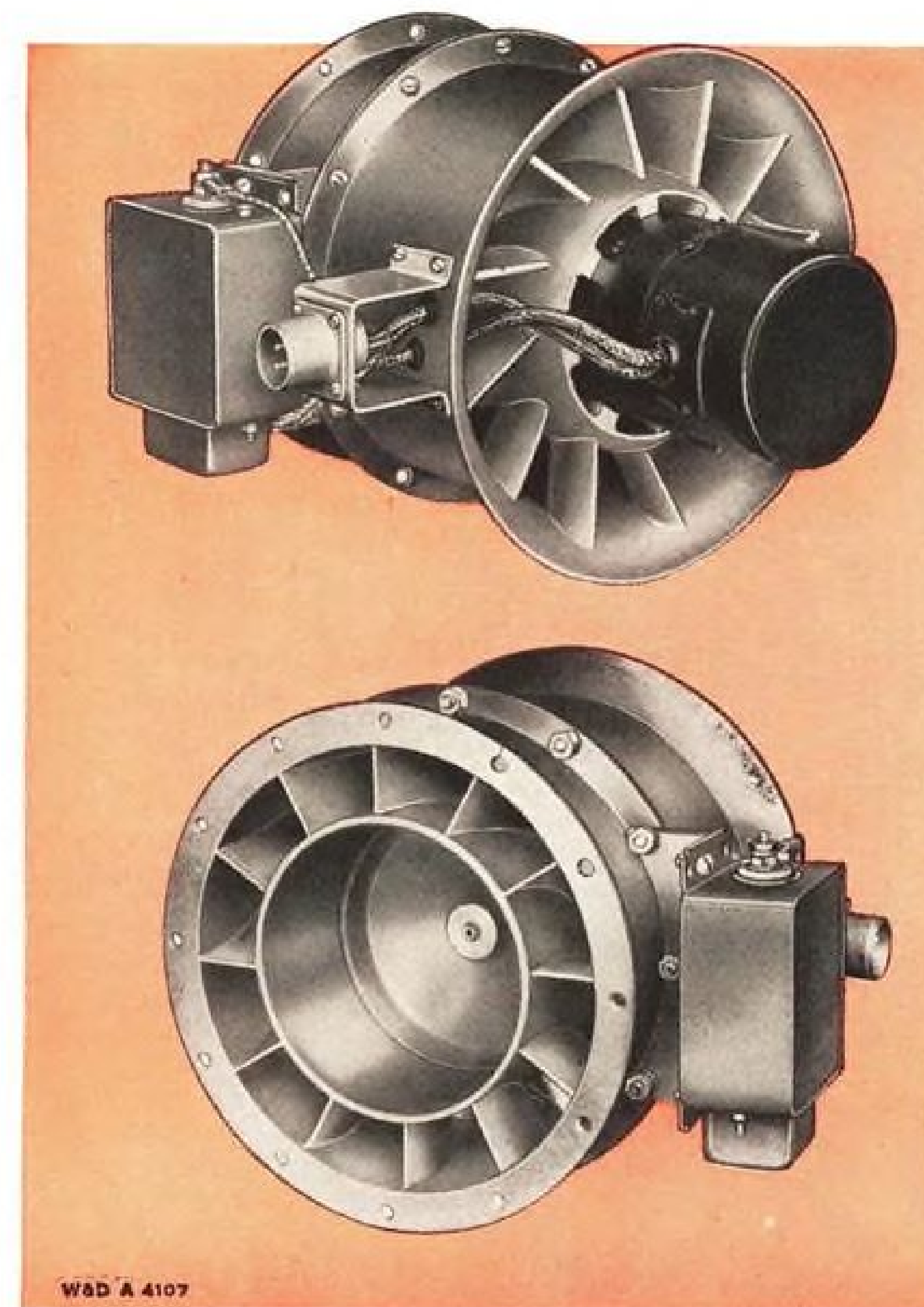
The system employs a new Double-Loop circuit to which as many as 132 detectors may be hooked in parallel. Power for each loop is applied at two points. So a break at or near one of these terminals leaves the other to supply current to the system, which continues to function in whole (if break is right at terminal) or in part (if break is somewhat downstream past a number of detectors). A single break at the worst point in the loop, midway between both power points, can knock out no more than 50% of the detectors in a particular loop.

In effect, the detector elements are hooked in parallel to a circuit powered in parallel. Formerly, a break at or near the power bus in a circuit getting current from a single point would knock out all or most of the detectors.

Each detector weighs 2.5 oz. and is designed to comply with CAA Techni-



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The North American B-45 "Tornado" Bomber, like most U. S. aircraft, has many features designed solely for the flight personnel's comfort.

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The versatility of this system is largely dependent upon that of the Joy AXIVANE Fan. The fans used on the B-45A, B-45C, and RB-45C provide 250 CFM at 6.5" W.G., yet they are only 6.5" in diameter and weigh but 9 lbs.

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cal Order C11 and SAE 401A Specifications. The switch assembly is hermetically sealed.

Inside the detector, the contact points which close the alarm circuit are mounted to a couple of leaf springs which are bowed out under compression to keep the contacts apart. The metal in these springs has a low temperature coefficient of expansion. The outer stainless steel shell of the detector doubles as a housing for these operating components, and as one of the expanding components. A rise in temperature causes the outer shell to expand faster than operating parts within and reduce the compression on the springs. This allows the contacts on the springs to come together and close the circuit.

Fenwal, Inc., 270 Pleasant St., Ashland, Mass.

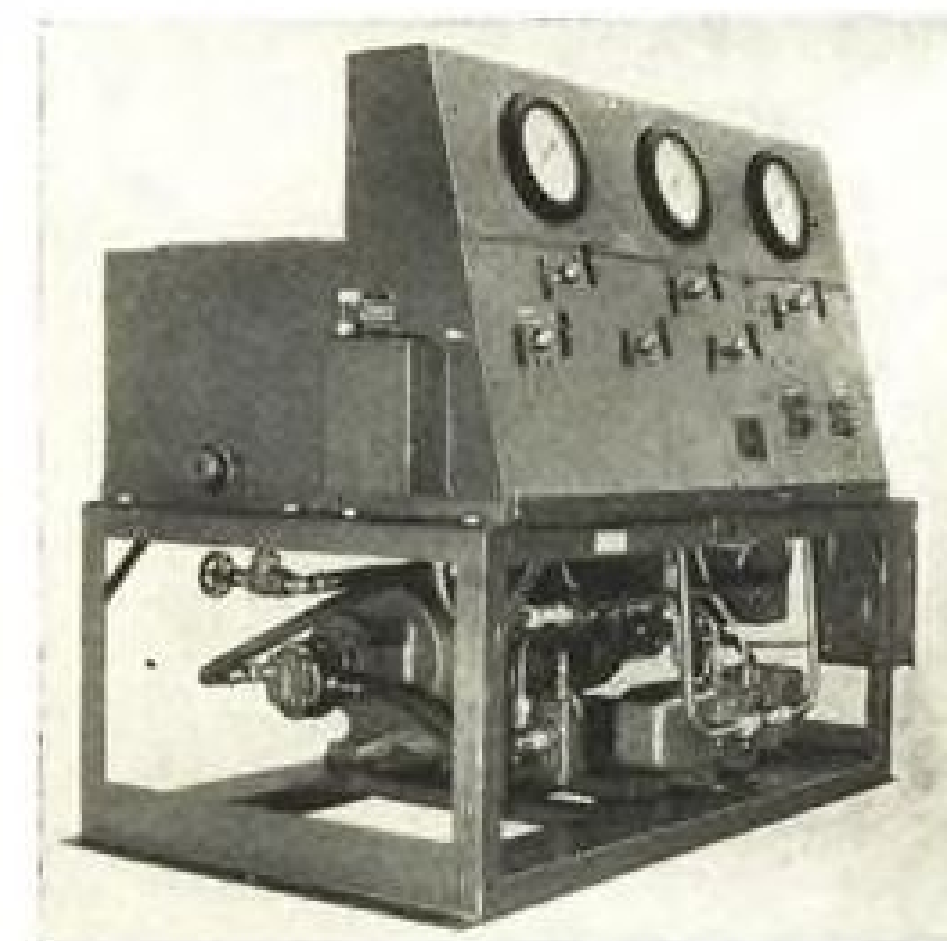
Lear's New ADF

An automatic direction finder for civilian aircraft, identical to equipment being produced for military planes, is being marketed by Lear, Inc.

The equipment is suited particularly to executive craft and is built for heavy duty use, resisting extreme shock and vibration, the maker claims.

It consists of four main components—the tuner, shock-mounted amplifier, an azimuth indicator and an entirely new hermetically sealed loop which can be flush mounted. The loop is smaller than previous types.

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AVIATION WEEK, October 27, 1952

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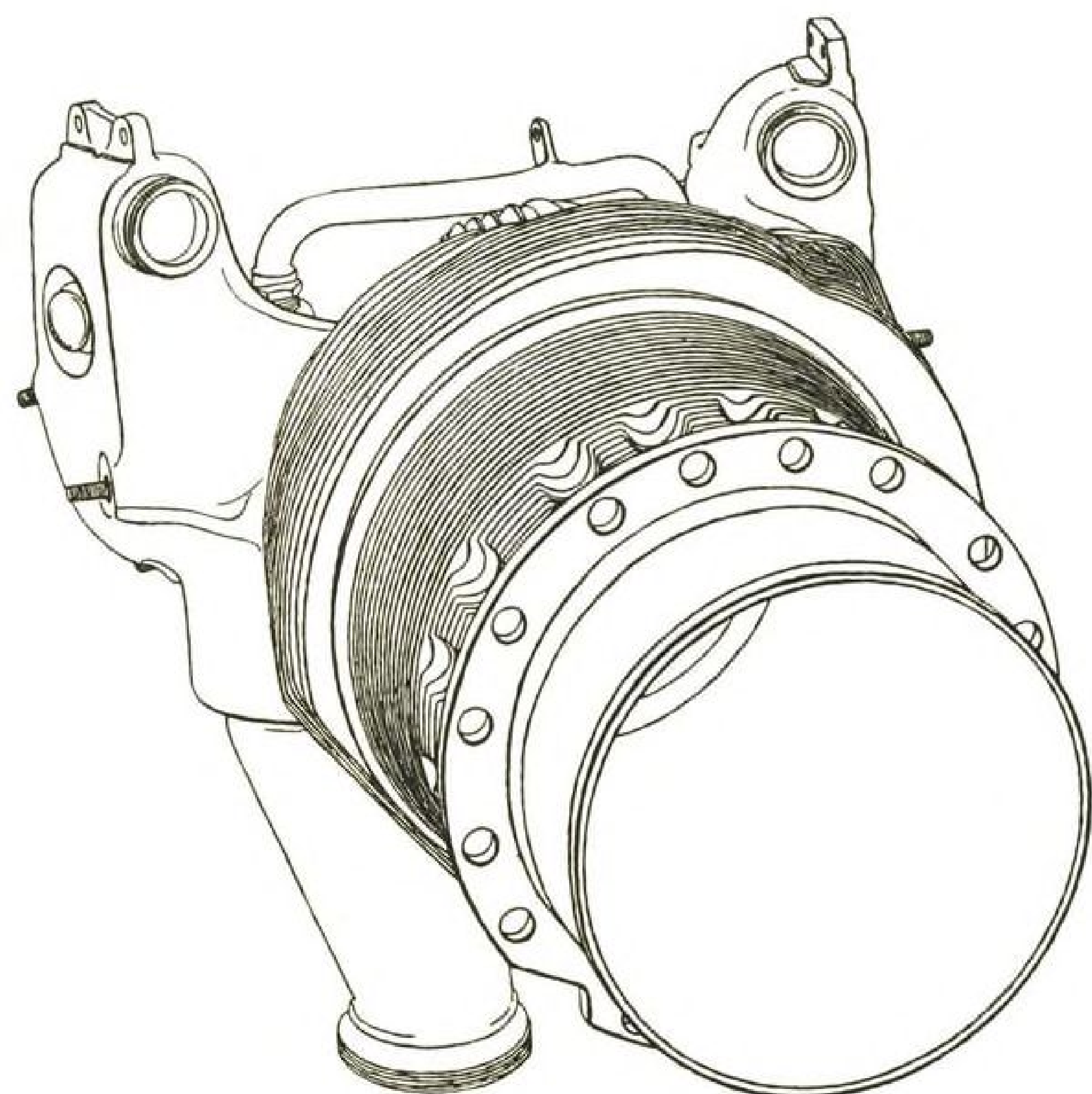
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O-Rings for Jets

A new synthetic O ring compound said to be impervious to attack from synthetic lubricants and hydraulic fluids that must be used with jet engines, has been developed.

New lubes were prepared, with the advent of the jet, to meet extreme service conditions beyond the performance capabilities of petroleum-base lubricants. But the new lubricants which are ester-based, caused deterioration of conventional synthetic rubber seals.

Precision Rubber Products, which claims it is the largest producer exclusively of O rings, put its engineers to work to meet the situation. They developed Compound 142-70, which meets all requirements of MIL-R-7362 specification covering rubber products suitable for use with the synthetic lubricants. Military specs covering some of these oils are MIL-L-7808, MIL-O-6085, MIL-O-6387 and MIL-E-3278.

The new compound also has been approved by various jet engine and accessories manufacturers as meeting their own particular specifications, the firm reports.

Precision Rubber Products Corp., Dayton, Ohio.

ALSO ON THE MARKET

Midget packing gland, designed as standard seal for entrances to thermocouple wells, pitot tubes, static pressure probes, round rods and tubes and the like has been announced by Conax Corp., Buffalo 21, N. Y.

"Oyltite" is a sealer in stick form that stops oil leaks in pipes while oil continues to run through, or in storage tanks when stored. Product was developed to replace more expensive methods of sealer, involving possible shut-down of equipment. May have aircraft in-flight application. Lake Chemical Co., 3050 W. Carroll Ave., Chicago, Ill.

Blueprinted layouts of factory or office installations can be made quickly with Repro-Templates which represent machine tools, office desks to ¼-in. scale. After templates are placed in desired location on special film grid layout simulating factory or office area, the whole copy can be run through conventional blueprint, Ozalid or photostat machine for number of prints desired. Repro-Templates, Inc., Oakmont, Pa.

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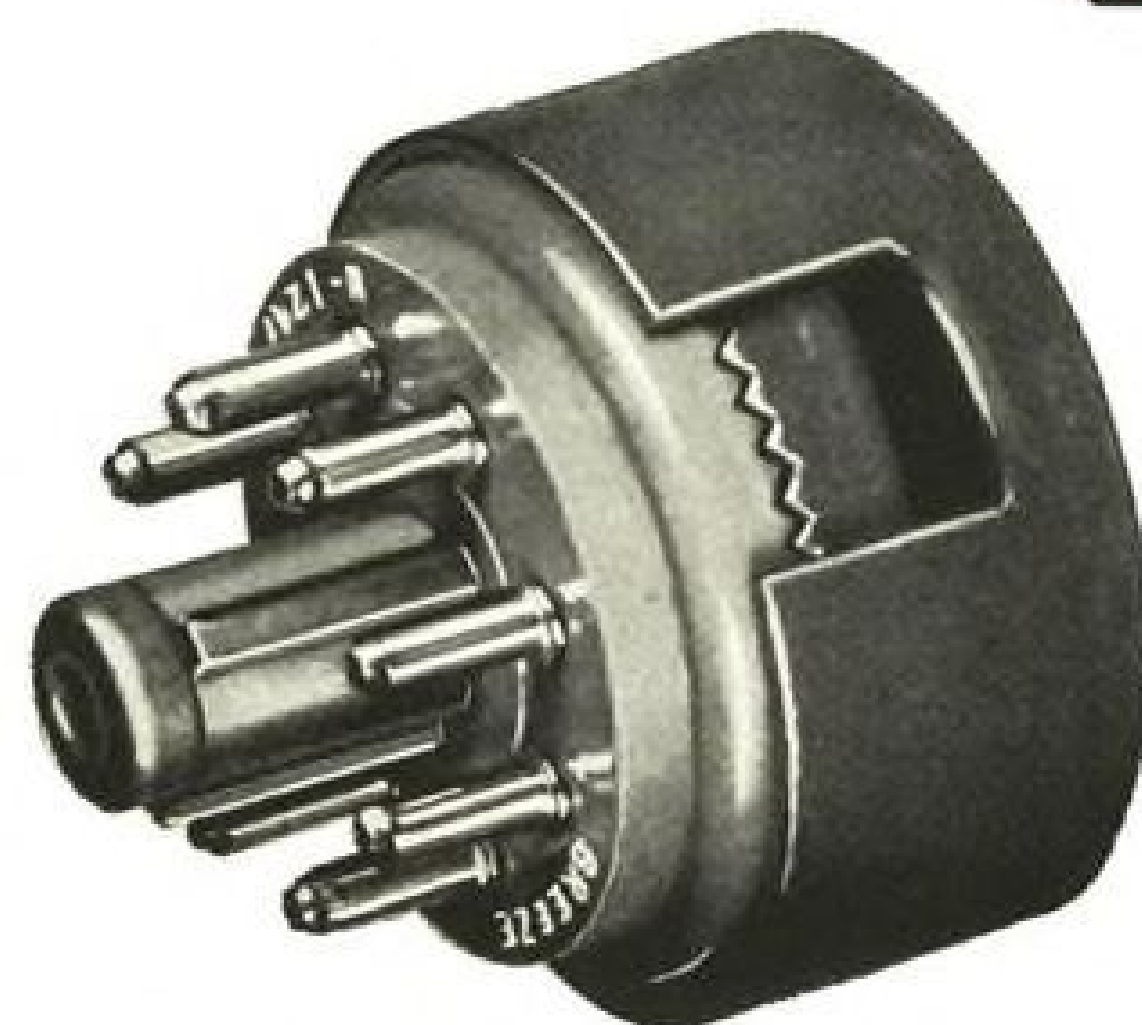
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AIR TRANSPORT

CAB to Curb Powers of Its Chairman

- **Members say that Nyrop made nearly all decisions.**
- **Now they plan to revert to the pre-1951 setup.**

By Lee Moore

There'll be some important changes made in Civil Aeronautics Board procedures next week, aimed to make the Board more of a judicial body and less of a one-man administration. The powers of the Chairman will be cut down to size.

CAB Vice Chairman Oswald Ryan last week was designated temporary chairman for the two months to the end of this year by President Truman. Since Ryan is a Republican appointee, the designation appears a routine interim measure. Ryan has been "acting chairman" in similar situations before.

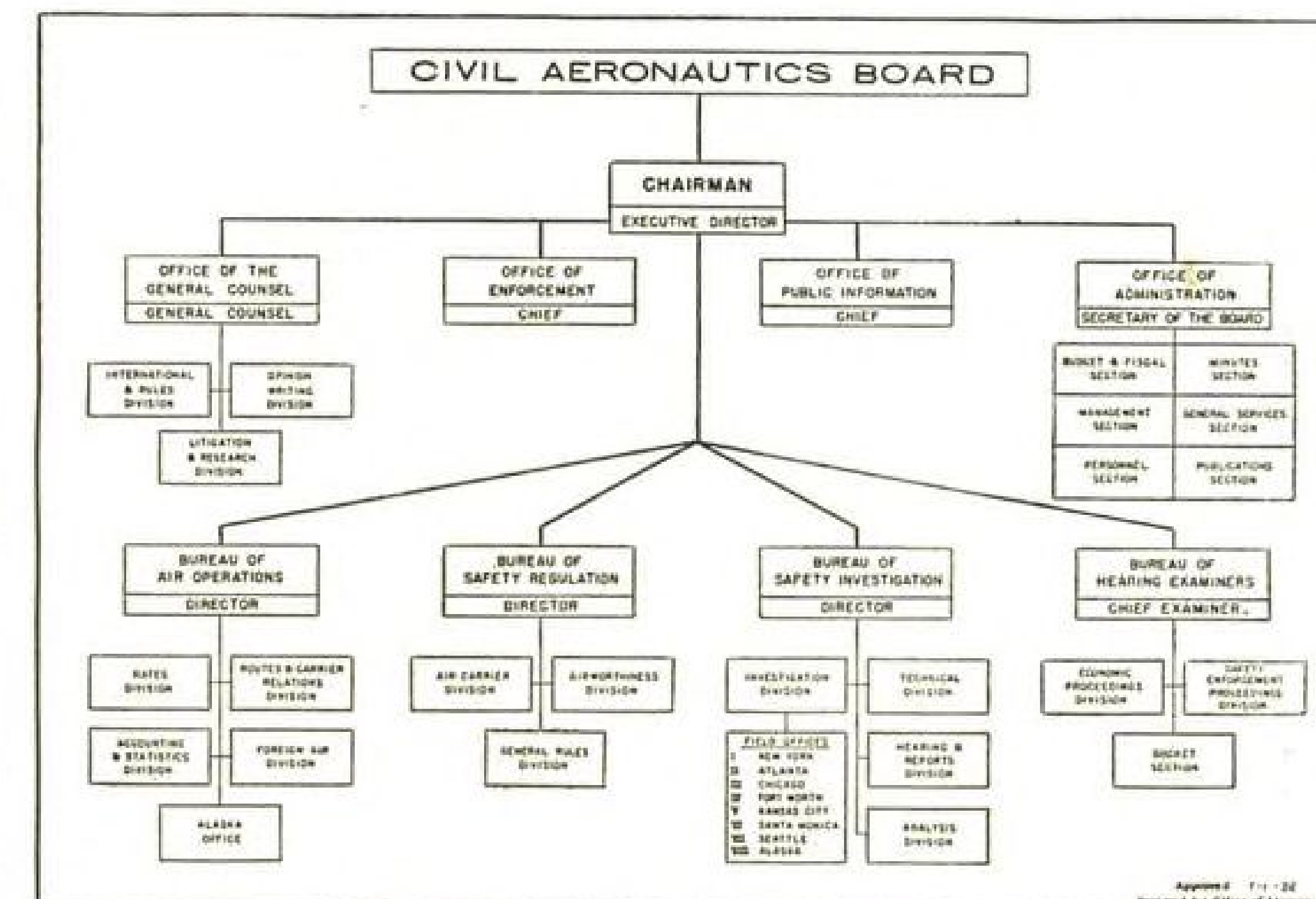
Next Monday morning, Nov. 3, the four CAB members left by the resignation of Chairman Donald Nyrop will meet in executive session as usual in the Board room. But their action will be unusual, because they again will be in control of CAB organization and staff affairs after two years in which the Office of the Chairman has generally handled these matters single-handedly.

The four members have resented their back-seat position in Board affairs the last two years. One member told AVIATION WEEK he had to spend half his time guessing and sleuthing to find out what half-concluded decision the Chairman-controlled staff was going to surprise him with next.

Here are major changes the members will prepare next Monday:

- The CAB staff and its executive director shall report to the whole Board.
- Staff hiring and firing shall be with approval of the Board for bureau directors, their assistants, division heads and perhaps even section heads.
- Budget allocation shall be with approval of the whole Board; this applies to staff-project assignments as well as annual program.

These powers have been the Chairman's, as a routine, since previous Chairman Delos Rentzel reorganized CAB machinery and passed it on to his hand-picked successor, Donald Nyrop, who resigns this week—effective Nov. 1.



THIS SETUP of Civil Aeronautics Board will change soon if the remaining four members carry out their plan to consolidate the post of Chairman into the Board. The executive director would report direct to the Board.

The Board members, other than the Chairman, have found that the Chairman's control of the staff has resulted in his running the Board more like an administration than a quasi-judicial board for commission. His power to hire and fire the staff and plan its work gave him the potential power to influence ultimate decisions of the whole Board, the members believe. So, even though one of the four remaining members is likely to be designated Chairman by the next President, it is believed that they already have agreed to curb the recently acquired powers of the Chairman's office.

Once that is done they plan to study the rest of the CAB machinery created by Rentzel and Nyrop in the interest of administrative efficiency. Many prominent airline attorneys in Washington have told AVIATION WEEK that the elimination of "public counsel" was a bad idea. Under the 1951 reorganization recommended to Rentzel by the management-efficiency study of Booz, Allen and Hamilton, public counsel was abolished. The attorneys were split up and assigned to the individual bureaus. Public counsel in economic cases came under the direction of the Bureau of Air Operations director and acquired the new title of "bureau counsel." Washington attorneys generally be-

lieve that was carrying functional organization too far for a quasi-judicial board whose chief reason for existence is to assure due process of law and independence—not administrative efficiency.

► **Reorganization**—On recommendation of the Hoover Commission and Congress' Reorganization Act of 1949, the President in 1950 transferred CAB's housekeeping responsibility from the whole Board to its Chairman. But this was for housekeeping efficiency. Certain guarantees of Board control of policy and staff philosophy and action were written in.

Here is that reorganization plan of the President:

"Section 1. Transfer of functions of the Chairman.—(A) Subject to provisions of subsection (B) of this section, there are hereby transferred from the CAB . . . to the Chairman . . . the executive and administrative functions of the Board, including functions of the Board with respect to (1) The appointment and supervision of personnel employed under the Board, (2) The distribution of business among such personnel and among administrative units of the Board, and (3) The use and expenditure of funds.

"(B) (1) In carrying out any of his

functions under the provisions of this section, the Chairman shall be governed by general policies of the Board and by such regulatory decisions, findings and determinations as the Board may by law be authorized to make.

"(2) The appointment by the Chairman of the heads of the major administrative units under the Board shall be subject to the approval of the Board.

"(3) Personnel employed regularly and full time in the immediate offices of members . . . shall not be affected. . . .

"(4) There are hereby reserved to the Board its functions with respect to revising budget estimates and with respect to determining upon the distribution of appropriated funds according to major programs and purposes.

"Section 2. Performance of transferred functions.—The Chairman may, from time to time, make such provisions as he shall deem appropriate, authorizing the performance by any officer, employee, or administrative unit under his jurisdiction of any function transferred to the Chairman by the provisions of this reorganization plan."

The keys to Board members' authorization to change the present setup lie in:

"(B) (1) . . . Shall be governed by general policies of the Board. . . ."

"(B) (2) . . . Appointment . . . of the heads of major administrative units . . . shall be subject to approval of the Board."

"Sec. 2. . . . The Chairman may, from time to time, make such provisions as he shall deem appropriate. . . ."

Now the four Board members are all together on plans for a change.

► **New Board Member**—CAB was set up as a five-man board, with no more than three members to be of the political party in power. Appointment of a new member to fill the vacancy created this week will go to whichever presidential candidate wins the election this Nov. 4.

But it is unlikely that the appointment will occur until January or February. It may be a considerable time after the new President takes office, as he will have a host of candidates to sift for this one spot as well as Cabinet, administrative, commission, ambassadorial and other positions. However, it is possible that if Stevenson wins the election and already has a man picked for CAB, Truman might make an interim appointment, which Stevenson would later recommend for congressional approval to serve out Nyrop's term to Dec. 31, 1953. But odds are that there will be only a four-man Board, with Vice Chairman Oswald Ryan acting as Chairman until about February, as has happened before.

► **New Chairman**—The President designates which member shall serve as Chairman. Among the four present

members, Washington observers currently give Sen. Chan Gurney the edge for the 1953 chairmanship under the Republicans because he is a popular ex-senator, and Joseph Adams under the Democrats because vice-presidential candidate Sparkman approves his independent policy. However, there is always the possibility that the new fifth member might be designated Chairman.

But one thing is almost certain. The new Chairman will find the office returned more nearly to its pre-1951 status: more of a chief justice, less of an administrator.

Whoever the new Chairman may be, present members hope he will be one of them so that he already will know the ropes. Also, these four members understand each other and are personally friendly, although their policies vary. Republican members Gurney and Ryan favor limiting competition, Democrat Adams is more favorable to substitution of free competition for bureaucratic regulation and Democrat Josh Lee is in the middle.

► **No Rancor**—The CAB members plan some reorganization but not as a personal reflection on the last two CAB

chairmen nor on CAB staff executives. They want to amend procedures after two years' experience with the current administrative setup, which has eliminated too many judiciary "checks and balances" in the interest of immediate "functional" government.

For example, resigning Chairman Donald Nyrop is generally regarded by the aviation industry as an able administrator. But the attorneys and four members of the quasi-judicial Civil Aeronautics Board objected to his direct control over the CAB staff, resulting in a degree of indirect influence on presentation of cases and their decision. They believe the Board's recent administrative procedures went beyond the concept of a five-man Board.

Washington attorneys consider Ronald Cohen, "bureau counsel" of the Bureau of Air Operations—vital factor in economic cases—as a fair and unprejudiced counsel. But to guarantee more independence for him and other CAB counsel, they recommend that the attorneys be freed from bureau administration and re-consolidated into one independent "public counsel" reporting to the five-man Board.

New Mexican Air Treaty Talks Set

U. S. also ready to seek bilateral agreements with Venezuela, Colombia; awaits Japanese action.

The State Department and Civil Aeronautics Board—stymied in Mexican airline relations since 1945—will try again next month to negotiate a bilateral air treaty with Mexico. The President recently withdrew the inoperative Mexican certificates of Braniff, Eastern and Western to "clear the air."

The many previous attempts were complicated by "interference" of U.S. carriers—not only the three that wanted to get in but also American and Pan American, who already serve Mexico.

The Mexicans want monopoly routes for their carriers into the U.S. to prevent their being outclassed by the bigger, stronger U.S. operators. The U.S. would like to prevent situations like the present Compania Mexicana de Aviacion monopoly on Mexico-Los Angeles service.

Other current air transport problems of the State Department aviation policy staff include:

• **Venezuela, Colombia.** State hopes to conclude bilateral agreements with these two soon, but admits there's been no recent progress. U.S. has not yet carried out its threat to restrict Linea Aeropostal Venezolana service as Venezuela restricts U.S.

• **Trans-polar route for SAS.** Scandinavian Airlines wants rights for scheduled operation to the West Coast via

the Air Force strategic air base at Thule, Greenland. Only obstacle may be USAF, where opinion is divided: Some say since Thule is Danish-owned, there's no question; others worry about revealing Thule to weekly civilian passenger scrutiny.

• **Japanese treaty.** The U.S. awaits Diet ratification of its bilateral agreement. U.S. is also curious whether the Japanese government will certificate both or only one major Japanese applicant for San Francisco service.

• **Regional fares discrimination.** State Department is worried over Argentina's attempts to force Aerolineas Argentinas competitors to charge higher fares. If this practice grows, it can end in protectionism by many countries. Some Middle East nations are already rumored to be considering edicts similarly discriminating against foreign airline business. International Air Transport Assn. wants to ban it, but depends on unanimous agreement. Argentina is a member. Alternate solutions are: persuading Argentina to stop; ignoring Argentina's unilateral action, or dropping Argentina from IATA.

• **International air-ground damage.** The U.S., Britain and The Netherlands refused to sign the recent Rome convention (treaty) on rights of third parties on the ground to claim damages from

aircraft accidents. The U.S. wants to study four controversial points. First, the U.S. wants the burden of proof placed on the air operator rather than the claimant.

Second, U.S. wants liability limits (and hence required insurance coverage) set high enough to give full coverage in anything but a catastrophe.

Third, U.S. wants the nation flown over to be able to pass on adequacy of the operator's insurance. The present draft requires only that the operator's own country certificate him as insured in accordance with this Rome convention.

Fourth, U.S. wants claimants allowed to sue in a convenient court. The Rome treaty would require trial in the nation where the accident occurred, unless any two parties agree on another location.

Foreign Liability Limits Are Settled

A new convention to regulate damage liability caused by foreign aircraft to third parties has been drafted in Rome under auspices of International Civil Aviation Organization. Fifteen countries have signed the instrument and as soon as five of them have deposited ratification of the Rome Convention it will come into force.

Signatories were: Argentina, Belgium, Brazil, Denmark, Egypt, Spain, France, Israel, Italy, Liberia, Mexico and Portugal.

The limits of damage liability agreed upon are:

- \$36,850 for planes weighing 2,200 lb. or less;
- \$36,850 plus \$29.48 for every 2.2 lb. over 2,200 lb. for aircraft over this weight but not exceeding 13,200 lb.;
- \$184,250 plus \$18.42 for every 2.2 lb. over 13,200 lb. for aircraft over this weight but not exceeding 44,000 lb.;
- \$442,200 plus \$11.05 per 2.2 lb. over 44,000 lb. for aircraft over this weight but not exceeding 110,000 lb.;
- \$773,000 plus \$7.37 per 2.2 lb. over 110,000 lb. for aircraft exceeding this weight.
- Liability in respect to loss of life or personal injury shall not exceed \$36,850 per person.

Under the new convention, lawsuits may be brought only in the courts of the country where the damage occurred except if there is agreement between both parties that the action be handled in the court of some other contracting state. Action may also be settled by arbitration.

Judgments rendered in the courts of one nation concerning damage caused by foreign aircraft to third parties on the surface will be enforceable in any other member state.

Subsidy Accord

- **Transportation segments agree aid must end.**
- **Objective: Stand on own feet, pay user charges.**

By Katherine Johnsen

A major drive, with airlines participating, is shaping up to have the next Congress establish a new national transportation policy calling for an end to government subsidy.

After years of bitter battling, members of the Transportation Assn. of America, representing all types of transportation, users and investors, finally have reached general agreement on two planks:

• **Self sufficiency.** The key objective is for each form of transportation to stand on its own feet and reimburse the government for facilities by paying user charges. But for air transportation, a substantial segment of which is still an "infant" industry, achievement of the objective should be properly "timed."

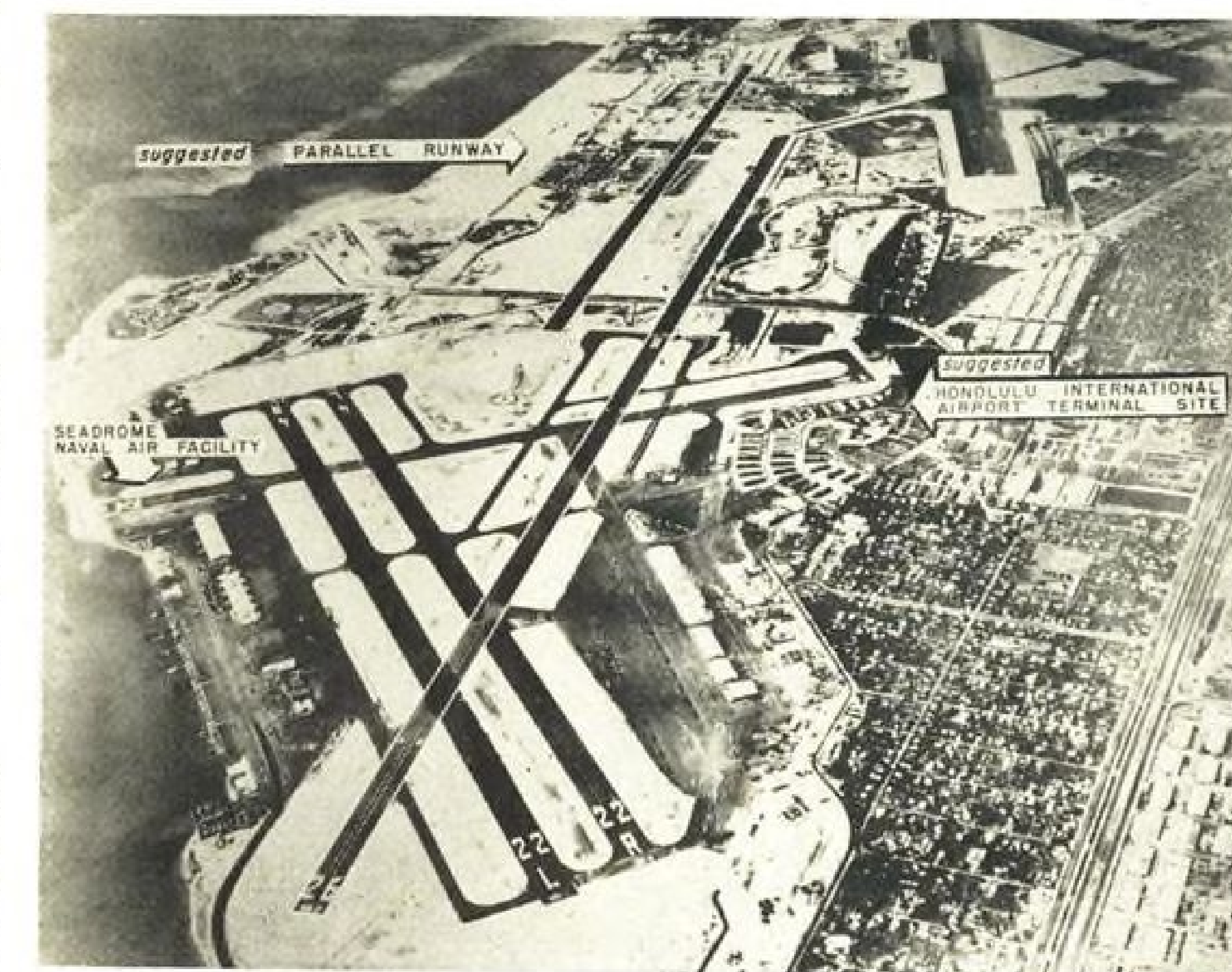
• **Competition between forms.** Different forms of transport should be kept competitive and the bars maintained against interlocking directorates and ownership of one type by another. Without government support, each would get its proper slice of the traffic.

TAA's five-man Policy Administration Board, headed by Frank Rathje, president, Chicago City Bank & Trust Co., has approved those fundamentals. Other members of the Board are: W. H. Day, Transportation Manager, Boston Chamber of Commerce; D. W. Brooks, president, National Council of Farmer Cooperatives; Gen. Brehon Somervell, chairman, Koppers Co., and P. V. Moulder, executive vice president, International Harvester Co.

► **Rail Victory**—The declaration on self-sufficiency contrasted sharply with the policy declaration of the 1938 Civil Aeronautics Act emphasizing "encouragement" and "promotion" of air transportation. It is a big victory for railroad interests who have long claimed that airlines were siphoning off rail passenger business with low fares possible because of mail subsidies. Airline representatives concurred in the declaration.

Air Transport Assn. general counsel Stuart Tipton commented: "We will support a plan of user charges to reimburse the government for facilities as long as everyone else does. But we don't want air transportation singled out. Let the railroads, too, pay user charges on the government facilities for their vast tug operations and Great Lakes shipping operations. They are not in favor of that."

Other air transport representatives on TAA are: Jennings Randolph, assistant to the president, Capital Airlines;



HONOLULU INTERNATIONAL DEVELOPMENT

Navy's plans for expanding its Barber Point Naval Air Station at Honolulu International Airport at first caused some consternation among civil authorities. The latter were counting on building a \$5-million terminal

building where Navy wants to put its new seaplane base. The conflict was ironed out at a conference, allowing the terminal plans to go ahead as originally envisaged. At upper right is USAF's Hickman AFB.

Charles Beard, vice president, Braniff International Airways; Paul Brattain, vice president, Eastern Air Lines; Erle Coker, assistant to the president, Delta Air Lines; John Leslie, vice president, Pan American World Airways; Robert Love, president, All-American Airways; W. S. Weismann, assistant vice president, American Airlines; John Weller, assistant to the chairman, Trans World Airlines.

► **Airline Victory**—The declaration against integration of transportation was a decisive airline victory over the railroads. Originally the majority representation on TAA-users, investors, railroads,

pipelines—favored integration. But on reconsideration, all representation, except railroads, opposed it. The rails are expected to drop their fight now and go along with TAA policy on the issue.

Final action on the Policy Board's recommendation will be taken by TAA's board of directors in December and be ready for presentation to Congress in January.

One major fight is still underway in TAA: whether a single regulatory agency should be established for all forms of transportation.

Railroads, consumers, and investors are fighting for it. But they are being

challenged by airlines, freight forwarders, pipelines, and waterways. Tipton commented: "Among those subject to regulation, it's four to one against a single agency."

The "self-sufficiency" policy for transportation has the backing of Commerce Department. Undersecretary for Transportation Jack Garrett Scott has laid down as the objectives for the long-range transportation study now underway:

- "Limitation of governmental assistance. . . ."
- "Imposition of charges upon the users and beneficiaries of transportation facilities . . . in whole or in part, but only when and to the extent that such charges are fair and equitable. . . ."

The Commerce Department plans to recommend legislation to Congress in January. By then, Commerce plans policies on user charges. Dr. Beatrice Aitchison, director of Commerce's Transport Economics division, is in charge of the project.

Meanwhile, Civil Aeronautics Administration has shelved its study to work out a system of user charges for airways facilities. Commerce has decided that it must work out a uniform transportation policy before suggesting an equitable system for taxing airways users.

TAA's Policy Board recommended amendments to the 1938 CAA Act to spell out these policies:

- "National policy should clearly be aimed at the ultimate payment of user charges sufficient to cover the users' fair share of the costs of building and maintaining the government facilities they need to use."
- "The major problem here involved is that of timing."
- "The government should permit and encourage the operation of the air transport system on a basis which will most readily bring about a condition of self-sustenance, without subsidy, and the provisions of the CAA Act, including that referring to 'public convenience and necessity' should be administered with that requirement and objective in mind."
- "Attention should first be focused on the placing of the carriers on a self-sustaining basis, without subsidy payments."
- "Civil Aeronautics Board (or a successor organization) should report to Congress every two years on the extent to which the industry, in whole or in part, has reached a state of maturity which makes it possible for it to stand on its own feet . . . and the measures it has taken to accelerate such a state of maturity."
- "As to airway user charges, the first step should be the exaction of user charges, which when taken with the industry's present contributions, will cover the fairly allocated share of the cost of

maintaining and operating airway facilities provided by the government and reasonably needed and used by the carriers in their commercial operations."

- "All users of airports should pay their fair share of the cost of facilities."
- "Allocations of cost should, of course, reflect the government's active use of its own facilities plus its requirement for stand-by facilities for later periods of more active military use."

"The fact that some communities build airport facilities of a capacity not justified by requirements over a reasonable period should not be considered a reason why users of such airports should pay a share of the cost of the excess facilities."

M-Day Plans

- **Procedure of airline in emergency undecided.**

- **Disagree on allocation of planes left for civil use.**

Airline mobilization planning is still in the debate stage.

Airlines are arguing with Air Materiel Command on terms for plane modification and with Civil Aeronautics Board on how they should divide up the airliners left at home after overseas mobilization.

Some two years ago, shortly after outbreak of the Korean war on June 26, 1950, Air Force, the airlines, National Security Resources Board and CAB laid plans to modify four-engine airliners for 48-hr. readiness for overseas military-contract operation. They are still planning, and so far no modification has started.

Latest deadline for the airlines to sign modification contracts with AMC was last July, but terms still are in dispute—especially the question of which items shall be "fixed price" or "reimbursable."

Air Force appropriations expire the end of this fiscal year and observers expect that before next June the money to carry out initial phase of the two-year-old plan will be obligated.

► **Logistics Working Group**—Meanwhile, the airlines met with DATA administrator Ray Ireland Oct. 9 to discuss new plans—setting up a "logistics working group" to carry on airline mobilization planning. It became an official plan this month.

First job of the new planning group is to "compile a complete list of facilities and supplies to be procured and stockpiled immediately by the Air Force for all bases" through which the reserve fleet will operate. Subsequently, the group is to work out all other operation

plans, a Commerce Dept. press release stated last week.

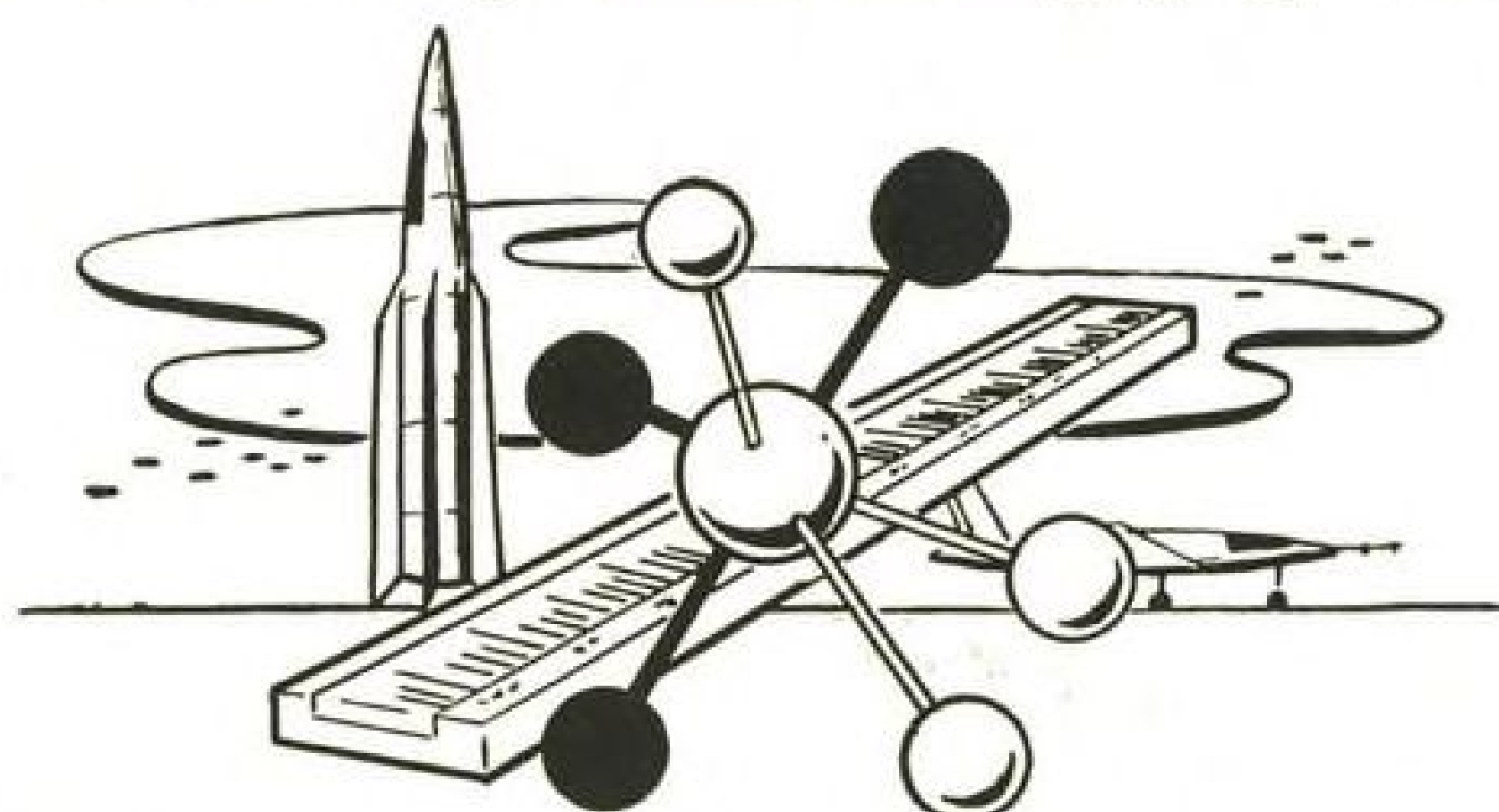
The group includes a "top committee," an Atlantic and a Pacific committee, and six technical advisory groups, Ireland stated. The top committee is a policy group of airline, AF, MATS, AMC and DATA representatives that would meet occasionally. The Atlantic and Pacific committees will do the detailed planning and the technical groups would handle communications, flight operations, engineering and maintenance, stores and purchasing, ground traffic and manpower. Working group personnel have yet to be named.

► **Dividing the Rest**—DATA and CAB have given the airlines until next month

to fight it out between themselves on how they should divide up the planes left behind after mobilization. Two months ago, CAB Chairman suggested that remaining planes be allocated on the basis of the revenue ton-miles flown last year.

The individual airlines have naturally sent many complaints: United cites a month-long strike last year that stunted its ton-mile showing; Northwest cites its Martin 2-0-2 grounding; smaller airlines with lower load factors want the distribution formula based on available ton-miles instead of actual revenue ton-miles flown; big airlines and the non-skeds want a decision based on revenue ton-miles flown.

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SHORTLINES

► **All-American Airways** may be in for an internal major shakeup, some Washington observers say.

► **Air Transport Assn.** Economic Research division has its continuous traffic origin and destination survey ready to go now if ATA directors approve it. Instead of complete semi-annual reports a year or two late, this would furnish a continuous 4% sample from month to month. . . . ATA President E. S. Land predicts "the advent of jet aircraft in U. S. overseas operation by late 1957 or early 1958."

► **American Airlines** says "no-show" passengers have declined 50% since the industry started its reservations reconfirmation rule for out-of-town passengers. This makes more seats available in time for other passengers—helps both business and the passengers, American points out, adding that more than 40% of passengers begin their trips at cities other than where they board the plane. . . . Company has DPA certification for rapid write-off of its 25 DC-7s valued at \$47,417,500.

► **British Commonwealth Pacific Airways** shakeup and eventual merger with Qantas Empire Airways is still in the works between Britain, Australia and New Zealand. But one problem is that outright merger for one service to Canada and Britain would involve withdrawal of either Britain or N. Z. from BCPA or expansion in ownership of Qantas.

► **California Eastern Airways** and Overseas National Airways midair instrument approach DC-4 training flight collision at Oakland Nov. 17 a year ago, killing the ONA crew of three, is blamed by CAB on insufficient lookout by the ONA safety pilot and observer and failure of CEA safety pilot to carry a qualified observer aboard.

► **Chicago & Southern Air Lines** announces that CAB's expedited procedural steps in the Delta merger case "should result in the final decision being announced during November."

► **Civil Aeronautics Administration** statistical study of enplaned passengers last year reveals that New York City generated 12% of scheduled domestic traffic and Chicago 8½%. Some 22 cities gave 65% of the total. . . . May not ask Congress for jet prototype testing funds next year, having failed the last two years. . . . CAA does plan to

try again for funds to build a new giant Washington airport at Burke, Va., scuttled last session by budget problems and opposition from Baltimore, which hopes to make Friendship Airport Washington's long-distance air travel terminal.

► **Civil Aeronautics Board Examiner** Paul N. Pfeiffer urges renewal of Frontier Airlines' certificate with route changes estimated to cut subsidy need about \$360,000.

► **Commerce Department**, which had planned to announce an airways "user charges" program next month, has now shelved it pending integration with an overall transportation policy at a later date.

► **Flying Tiger Line** predicts that "freight traffic will surpass the air passenger business within the next decade." President R. W. Prescott told stockholders the seven DC-6As on order will increase Tiger capacity of 38 C-46s and C-54s by 40%, reduce operating expenses by 20 to 25% and develop a volume about one-third greater than today's.

► **KLM Royal Dutch Airlines** reports starting its Amsterdam-Montreal-Mexico DC-6 service Oct. 27 and this month also will extend its South American line to Santiago, and schedule three all-cargo flights a week to New York.

► **National Airlines** has received the first of its order of eight new 66-passenger Douglas DC-6Bs. They will add annual capacity of 60,000 passengers between New York, Washington and Florida this winter, NAL says. The "Bs" are part of a \$30-million expansion program for the next two years, which also includes eight Convair 340s and four DC-7s. Total program will more than double National's capacity by early 1954.

► **Northwest Airlines** load factor the first week of October was 65% compared with total October average a year ago of 73%. This year's September average of 70% compares with 74% a year ago. . . . August revenues of \$5,654,775 were an all-time monthly record, with net profit after taxes of \$490,542.

► **Pan American World Airways** will build a \$500,000 mechanized engine-overhaul shop at San Francisco Airport to service the entire Pacific Alaska division. It will be working at 50% capacity within 15 months and will carry inventory worth another half million dollars. . . . Company has contracted with Pacific Airmotive for Stratocruiser engine overhaul at Burbank, Calif.

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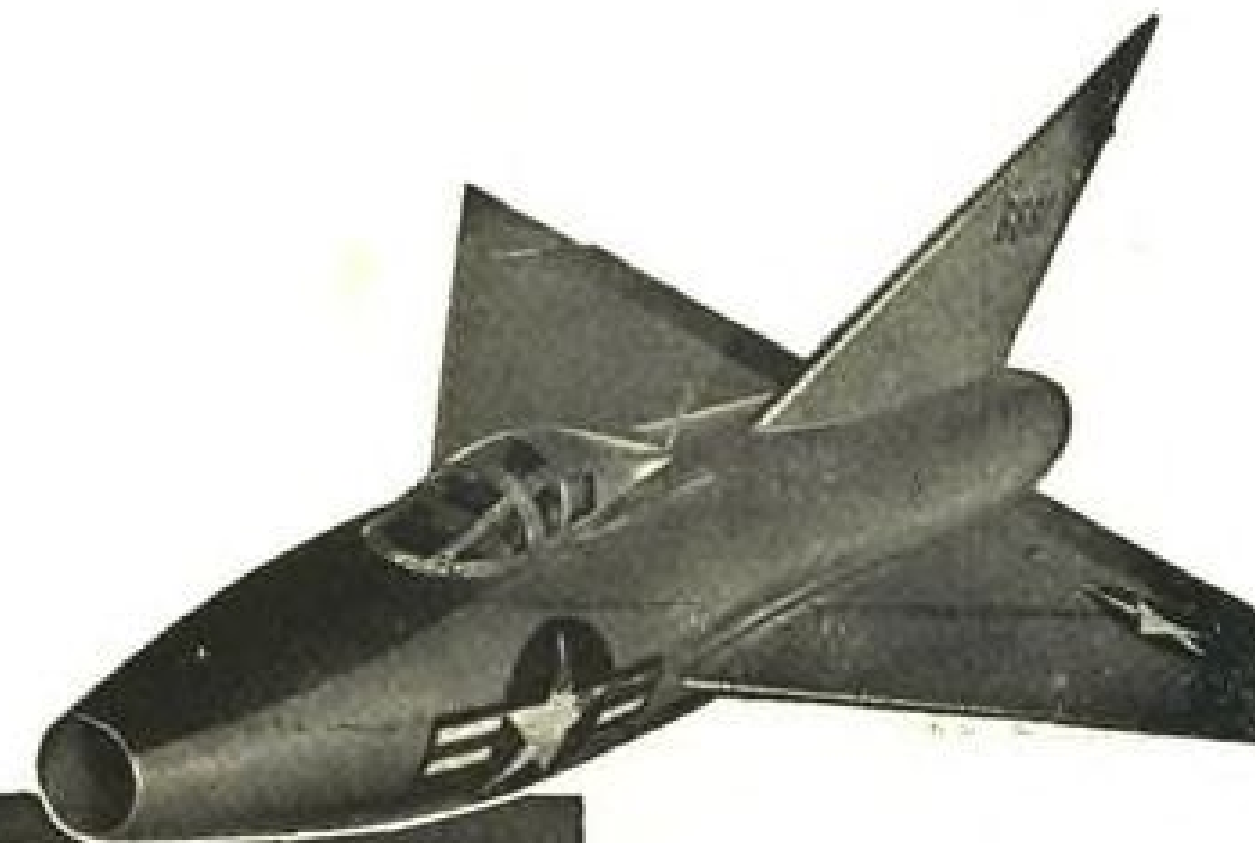
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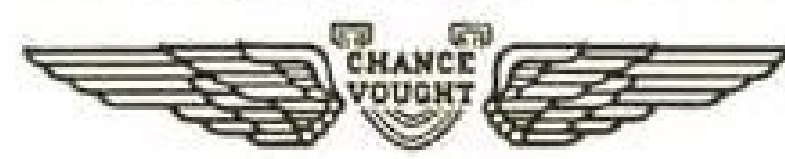
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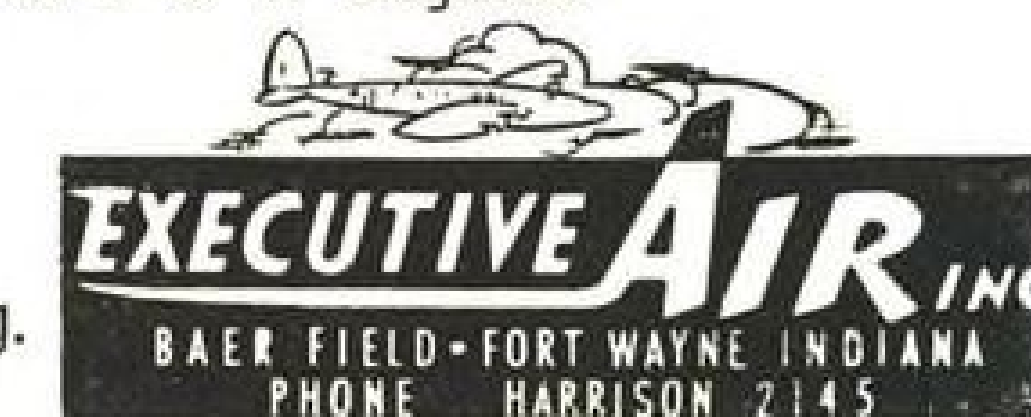
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| 11 | 14601-1F-B1 | Eclipse | Gyro Indicator |
| 71 | 828TY13Z2 | Weston | Oil Temp Indicator |
| 26 | 827TY14Z2 | Weston | Cyl Head Temp Indicator |
| 40 | 119862 | Weston | Carb. Air Temp Indicator |
| 10 | 15401-1 | Eclipse | Amplifier (PB10)w/ED3 MOUNT |
| 66 | 10078-1AG | Eclipse | Gyro Indicator |
| 62 | CQ-9 | Eclipse | Clutch Switch (PB10) |
| 20 | 12078-1 | Eclipse | Amplifier (PB10) |
| 37 | MF45-3911-20Z | Vickers | Hydraulic Pump (3000PSI) |
| 327 | PF4-713-20BCE | Vickers | Hydraulic Pump |
| 75 | 1416-12C | Eclipse | Starter |
| 142 | 28008 | Alfred Research | Jack (Cowl FLAP) |
| 6 | 19011-1 | Eclipse | Transmitter |
| 85 | 3123-3A | Eclipse | Warning Unit |
| 45 | AN4103-2 | Clifford | Brass (Valve #U4785) Oil Cooler |
| 120 | MF9-713-15A | Vickers | Hydraulic Pump |
| 550 | TFD 8600 | Thompson | Fuel Booster Pump |
| 125 | D7818 | Adel | Anti-Icer Pump |
| 350 | AN4014 | Erie Meter | Wobble (D-3) Pump |
| 1000 | AN5780-2 | G.E. | Wheel & Flap Position Indicator |
| 400 | AN5780-2 | Weston | Wheel & Flap Position Indicator |
| 115 | PAC42A | Parker | Primer |
| 70 | AN3213-1 | Scintilla | Ignition Switch |
| 450 | A-9 (94-32226) | Nasco | Ignition Switch |
| 90 | JH950-R | Jack & Heinz | Starter Motor |
| 53 | AN6203-3 | Bandix | Accumulator 10"-1500 P.S.I. |
| 140 | K14949E | Marquette | Windshield Wiper Kit |
| 188 | EYLC-2334 | Barber-Colman | Control |
| 11 | 12086-1C | Eclipse | Amplifier |
| 250 | 558-1A | Eclipse | Oil Separator |
| 100 | 716-3A | Eclipse | Generator (NEA-3A) |
| 89 | 318 | Edwards | Horn |
| 330 | 921-B | Stewart-Warner | Heater (200000 BTU) |
| 97 | 6041H-146A | Culler Hammer | Relay (B-12) |
| 22 | 0655-D | Aro | Oxygen Regulator |
| 65 | ASDC2 | CO2 Mfg. Co. | Fire Detector |
| 384 | 564-2A | Eclipse | Oil Separator |

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| 500 | 3506 | Flange |
| 130 | 8288 | Follower As'y |
| 814 | 35814 | Blower As'y |
| 53 | 48362 | Shaft |
| 75 | 48363 | Shaft |
| 56 | 48392 | Sump |
| 390 | 48461 | Gear |
| 78 | 76236 | Gear |
| 1178 | 84289 | Bearing |
| 113 | 84487 | Housing |
| 77 | 84591C | Nose Housing |
| 200 | 48350-D | Crankcase As'y |
| 200 | 84083 | Cylinder |
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| 19 | 1375F | Halley carburetor |
| 407 | SF9LN-2 | Bendix Scintilla Magneto |
| | (manufacturer's part No. 10-12453-6 Spec. AN9511) | |
| 42 | SF5RN-12 | Bendix Scintilla Magneto |
| | (manufacturer's part No. 10-26170-1) | |
| 185,000 | LS4AD1 | Spark Plug (Aero) |

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SO THEY TELL US

International

Aviation Week's world-wide scoop on details of the Comet 3 Oct. 6 brought some amusing reactions in England. Cautious Manchester Guardian front-paged the story and quoted it for almost a column, but said the report "was not wholly accurate." (We have in our office the source material for the basic data we published, in the handwriting of a de Havilland official!)

A responsible air officer at Fontainebleau told us "we have nothing in Europe yet to match the MiG." A Canuck F-86 wing was due as a thumb in the dike.

Washington

Investigators of the Senate Small Business Committee, making an on-the-spot survey of subcontracting policies of prime defense contractors, will visit most aircraft firms before the end of the year.

A private detective has been "investigating" a CAB member, trying to unearth "evidence" of malpractice, but in an interview with an AVIATION WEEK reporter, from whom he sought information, he disclaimed knowledge of identity of his employer. This is an indication of the kind of pressure CAB members undergo, to swing their decisions.

CAB Chairman Nyrop, just before his resignation, said in a speech that CAB is still the smallest independent regulatory agency in the government, with present payroll now 566, and current appropriation \$3.8 million.

Military Services

Latest military security snafu involves a picture of the Sperry Sparrow missile, published by Look magazine. Navy says it's still restricted; refused to release it to AVIATION WEEK after Look appeared; says it and Defense Dept. are "investigating." Look says it has a print, taken in 1949, marked "cleared." There is still concern in some Joint Chiefs of Staff circles that we are building bigger stocks of arms and aircraft "than we will need." These conservative officers worry constantly about possible future congressional investigations and public questions—if war doesn't come—as to why we "spent so much money for obsolete and unused planes." There is men like these who backed the stretchout and they will probably urge the next President to cut back aircraft after election. Just how powerful their pleas will be is problematical. The supersonic Bell X-2, delayed many months already by late delivery of Curtiss Propeller division's rocket engine, is in for another delay. Edwards AFB has sent the powerplant back to Curtiss for reworking.

Transport

Although the Port of New York Authority announced that Newark Airport will reopen fully with completion of a new runway, the public opinion situation in the Newark-Elizabeth area is still explosive and some groups will intensify their fight against any commercial traffic over the nearby cities.

One individual is conducting his own study to determine whether deletions are made, accidentally or otherwise, from the transcripts of testimony in CAB airline crash investigations. He claims that some remarks in an Elizabeth hearing weren't in the final record, and he expects to attend future hearings.

Safety

Alex McSurely, Aviation Safety Editor, reports:

Special devices center of the Office of Naval Research is studying a new optical indicator which will warn a pilot if the wheels of his plane are still in up-position, prior to landing.

A lightweight radar beacon for use by aviation personnel ditched at sea is designed to attract rescue planes which can home on its signal from 20 miles at 5,000 ft. altitude, or up to 50 mi. at 20,000 ft. Guidance is designed for within 100-mi. radius of the beacon. It weighs only 2½ lb., operates on a battery with life up to 150 hr., and is made by Simmonds Aerocessories.

Project for purging fuel tanks by using completely burned-out exhaust gas from the combustion chambers of a jet engine is underway at Wright Air Development Center.

WHAT'S NEW

New Books

Theory and Technique of Soaring by John Kukuski. Profusely illustrated with line drawings, 183 pages including index. Published by Pitman Publishing Corp., 2 W. 45th St., N. Y. 36.

A handy little volume by an experienced British and European soaring pilot designed to provide detailed answers to weather and flying problems. Although the author states that the volume is for other pilots, it probably would be useful for the soaring aspirant, though the considerable number formulas might look formidable to the tyro.

Included are chapters on meteorology, instruments, the mechanics of soaring, launching, landing, circling and soaring techniques, acrobatics and navigation.—EJB.

New Addresses

The Lane Engineering Corp. has been formed in Germany to work with German and other European manufacturers to assist them in building components and equipment to U.S. standards for USAF and NATO forces, principally under the off-shore procurement program.

The firm also will act as an agent for U.S. firms interested in setting up licensees abroad. Founders are Frank B. Lane, president, and Walter O'Haire, manager. Headquarters are at 86 Zeil Strasse, Frankfurt/Main.

Telling the Market

Bulletin 263 describes 10,000-lb. and 20,000-lb. hydraulic elevating sheet feeding tables and includes applications. Write the Raymond Corp., 10295 Madison St., Greene, N. Y.

Heat Resistant and Corrosion Resistant Alloy Castings in Industry discusses typical compositions regularly produced with applications, limitations and types of service suitable. Detailed charts. Write International Nickel Co., Inc., Dept. EZ, N. Y. C. 5.

Scholarship

An annual \$1,200 scholarship has been established by Zonta International to encourage graduate study by women in aeronautical engineering. The awards are in honor of the late Amelia Earhart and will be given to women who hold a bachelor's degree. For details write Miss J. Winifred Hughes, Alumni House, Syracuse University, 940 So. Crouse Ave., Syracuse 10, N. Y.

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EDITORIAL

The Reversible Prop Controversy

Civil Aeronautics Administration has forwarded a detailed rebuttal to an article recently criticizing CAA, CAB and industry for neglecting commercial airline safety, especially in regard to improving performance of reversible propellers.

Meanwhile, we have learned that four more propeller reversal malfunction reports have reached CAA from the airlines since the article appeared.

The article appeared in True magazine and was titled "The secret gamble that can kill you." The "gamble" was with "human lives."

AVIATION WEEK prints below the text of CAA's covering letter to the magazine. It was written Oct. 14 by Ben Stern, director of CAA's Office of Aviation Information, to Ken W. Purdy, editor of True:

CAA technicians have just completed an analysis of the flagrantly irresponsible statements set forth as "facts" by Donald Keyhoe in the October issue of True magazine.

Our experts have found, after a thorough examination, that many of the alleged incidents never occurred, and that many others are erroneously reported and have no relationship to reversing propeller operations.

The basic facts about reversible propellers are these:

(1) Four fatal accidents, in which 93 persons were killed, might have been prevented in the last five years had reversible props been available. In contrast, one fatal accident in passenger service has been caused by inadvertent prop reversing in flight.

(2) Reversible propellers are so important to safety that the Air Line Pilots Assn. has recommended strongly that they be required on all airplanes which do not now have them installed.

(3) Their rate of failure has been much lower than that for almost any other equipment of comparable type used on modern aircraft—to be specific, 0.00097 per 1,000 engine flight hours in scheduled operation.

(4) The so-called "manual lock," which the article implies was rejected by CAA before the prop-reversing accident of Feb. 11, 1952 was not even suggested to CAA until Mar. 25, 1952. The basic principle was accepted wholeheartedly, and it is expected that the manufacturer will have a version of such a governor ready for airline service testing in November. We are enclosing for your information the detailed analysis of Mr. Keyhoe's article. After looking this over, I wonder if you wouldn't agree that it would be advisable, if a contributor submits a similar article in the future, to offer us the opportunity of commenting on it in advance of publication. In this way we might help you avoid doing something which I feel sure is not your intention—damaging the reputation for accuracy, and damaging the reputations of honest, conscientious public servants by unsubstantiated charges of neglect of duty.

Mr. Purdy wrote AVIATION WEEK as follows:

Thank you for your opportunity to reply publicly to the CAA's comments on our article. . . . True's article is derived from much research and, far from being "flagrantly irresponsible," represents a considered and conscientious appraisal of the safety gamble.

The CAA analysis of propeller incidents succeeds only in picking a few flaws in our reporting or interpretation of the 29 cases we mentioned. (There are at least 10 cases we didn't mention, and two more propeller reversals have occurred in airline service since True's article appeared.)

The CAA analysis of other statements in the article consists of disputations comments, most of which we in turn dispute as to accuracy and applicability. Both analyses are silent on the non-propeller accidents we cited; only lack of space and regard for the reader's patience—the article as it stands runs to 6,000 words—prevented our listing a wide variety of safety lapses.

Nothing in the analyses or in Mr. Stern's covering letter negates the article's basic contentions that important safety measures have been inadequately devised and negligently implemented.

It is significant, we think, that from among all the parties named—the CAA, CAB, eight airlines, five airframe manufacturers, two propeller manufacturers—no demand for a retraction has been made to True, and no complaint has been directed to us except the CAA's defensive comments and a verbal protest from one airline representative. On the other hand, expressions of agreement have come from two organizations, the Air Line Pilots and the Flight Engineers, whose members work aboard the airliners.

We believe the article has had remedial results in at least two instances—in expediting work on propeller locks and in improving CAB checkup procedure. But these are obviously only minor gains, and much remains to be done. In the meantime, we feel True's article has had a wholesome effect in contributing to an increased and lasting concern for better safety.

AVIATION WEEK's Safety Editor, Alex McSurely, finds that competent industry technical observers are in agreement with at least one thesis in CAA's counterblast: that the safety achievements made possible by reverse pitch braking of airplanes are so important that they outweigh the hazard of inadvertent reversal.

But they go farther, saying this makes it even more essential that necessary steps be taken to add safeguards and eliminate this hazard.

The CAA letter's restriction above to discussion of planes "in passenger service" eliminated a Northwest Airlines Martin 2-0-2 crash in 1950 in Minnesota, in which four of CAA's own men and two NWA pilots were killed in a check flight.

Keyhoe had listed a series of 29 accidents or near-accidents involving propeller mechanisms, in which feathering and reversals of propellers were treated indiscriminately.

One especially loud protest from CAA concerned the article's discussion of a "manual lock" for a propeller. The agency denies pilots had made repeated complaints about reversing propellers, "apparently a case of confusion with the unrelated automatic feathering system."

CAA's rebuttal says, "It must be recognized that as long as reversing propellers are used there is always some small possibility that reversing may occur in flight. Every effort has been and is still being made to reduce this likelihood to the greatest possible extent. . . . The use of reversing propellers has undoubtedly prevented many more accidents than it has caused. This, and not fancied economic considerations, has been the sole basis for allowing reversing to continue in active airline use."

AVIATION WEEK's Transport Editor, Lee Moore, has compiled the following history, from CAA sources, of reversible propeller malfunction reports filed since the True article appeared:

Monterey, N. M., No. 1 prop, American DC-6—throttle was pulled back through the detent stop, but the prop did not reverse because it was not pulled back far enough to activate reversal. (Cause of throttle being free to come back through stop: loose throttle nut.)

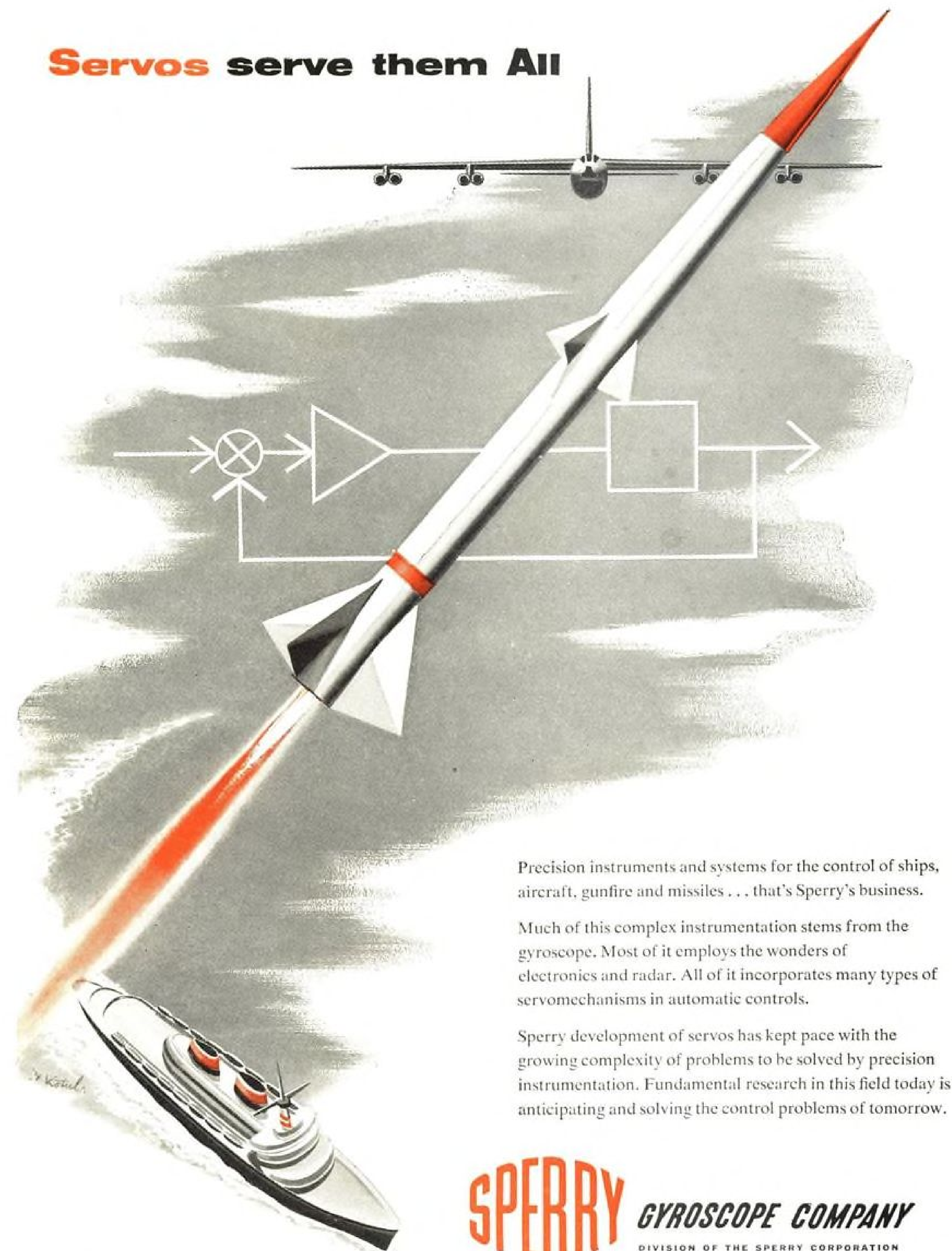
Eight days later, same plane, on a Dallas approach—all four throttles were pulled back through the detents, but again not far enough to cause reversal. (Cause: Small horizontal bar was worn.)

Rochester, N. Y., American Convair landing—pilot already had throttles back in reverse position as he touched down, but the plane bounced in a hard landing and he had what might be termed in-flight prop reversal during the bounce, as his first landing had released the solenoid. (Cause: Pilot error.)

Northwest Stratocruiser, Minneapolis—props were reversed after a normal landing. After the landing roll, the pilot opened throttle to taxi, but the No. 2 propeller remained in reverse. (Cause: Prop dome had a loose nut which jammed below the reverse pitch stop assembly.)

—Robert H. Wood

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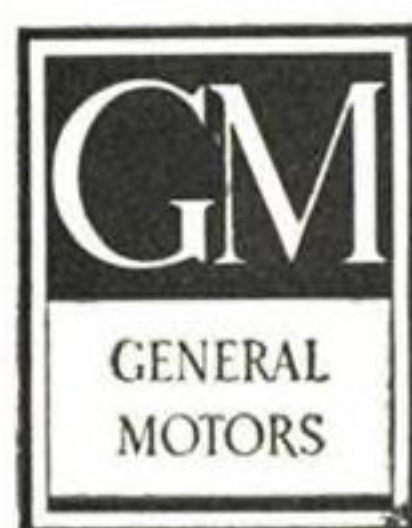
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